This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

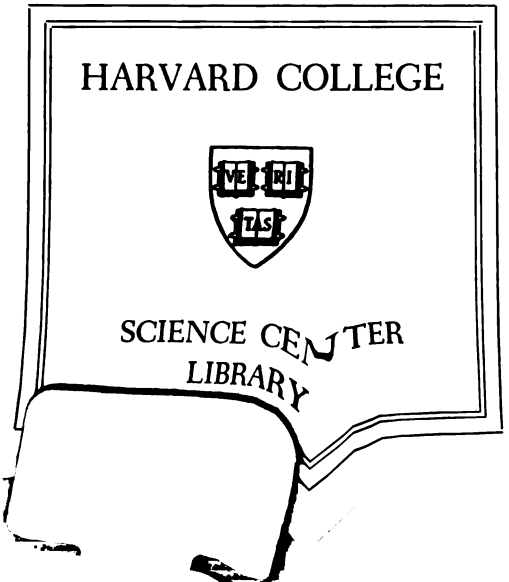
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

HARVARD
COLLEGE
LIBRARY



The Astrophysical Journal

A General Index

THE

ASTROPHYSICAL JOURNAL

A GENERAL INDEX

By Authors and By Subjects

to

VOLUMES I to XXV

(January 1895 to June 1907)

Compiled by

STORRS B. BARRETT

LIBRARIAN OF THE YERKES OBSERVATORY

CHICAGO

THE UNIVERSITY OF CHICAGO PRESS

1908

~~Sci 725.203~~

✓

Periodicals

J 7 1933

Prof. Thomas Sym[illegible]

Composed and Printed By
The University of Chicago Press
Chicago, Illinois, U. S. A.

THE ASTROPHYSICAL JOURNAL

EDITORS

Vols. I to XII, GEORGE E. HALE AND JAMES E. KEELER*
XIII to XIV, GEORGE E. HALE
XV to XXV, GEORGE E. HALE AND EDWIN B. FROST

COLLABORATORS

(Designated as Assistant Editors and Associate Editors in Vols. I to XIV)

J. S. AMES	I–XXV	ERNEST F. NICHOLS	VIII–XXV
A. BELOPOLSKY	XVI–XXV	A. PEROT	XXIII–XXV
W. W. CAMPBELL	I–XXV	E. C. PICKERING	I–XXV
*M. A. CORNU	I–XV	A. RICCÒ	XXIII–XXV
HENRY CREW	I–XXV	*H. A. ROWLAND	I–XIII
N. C. DUNÉR	I–XXV	C. RUNGE	XVIII–XXV
C. FABRY	XXIII–XXV	ARTHUR SCHUSTER	XXII–XXV
E. B. FROST	I–XIV	*P. TACCHINI	I–XXIII
C. S. HASTINGS	I–XXV	*H. C. VOGEL	I–XXV
WILLIAM HUGGINS	I–XXV	F. L. O. WADSWORTH	I–XXV
H. KAYSER	XVII–XXV	C. A. YOUNG	I–XXV
A. A. MICHELSON	I–XXV		

* Deceased.

The editors of the *Astrophysical Journal* gratefully acknowledge a grant of One Hundred Dollars by Professor E. C. Pickering from the International Science Fund of the Harvard Observatory to assist in the publication of this *General Index*.

GEORGE E. HALE EDWIN B. FROST

GENERAL INDEX TO VOLUMES I–XXV

AUTHORS

VOLUME AND PAGE

ABBOT, CHARLES G. Preliminary Statement of the Results of the Smithsonian Observatory Eclipse Expedition, May, 1900 . 12, 69
The Construction of a Sensitive Galvanometer for Spectro-Bolometric Purposes 18, 1
Samuel Pierpont Langley 23, 271
ABBOT, CHARLES G., and FREDERICK E. FOWLE, JR. A Prism of Uniform Dispersion 11, 135
ADAMS, WALTER S. The Variable Velocity of *ε Leonis* in the Line of Sight 11, 307
The Curvature of the Spectral Lines in the Spectroheliograph . 11, 309
Observations of the Earlier Spectrum of *Nova Persei* . . 14, 158
Some Results with the Bruce Spectrograph 15, 214
The Orbit of the Spectroscopic Binary *η Orionis*. (See also Errata, 17, 163.) 17, 68
Some Miscellaneous Radial Velocity Determinations with the Bruce Spectrograph 18, 67
The Radial Velocities of the Brighter Stars in the *Pleiades* . 19, 338
Review of: *Die Bilderzeugung in optischen Instrumenten vom Standpunkte der geometrischen Optik*, M. von Rohr . . 19, 387
Review of: *Spectroscopic Observations of the Rotation of the Sun*, J. Halm 21, 385
The Orbit of the Spectroscopic Binary *ζ Tauri* . . . 22, 115
Some Notes on the H and K Lines and the Motion of the Calcium Vapor in the Sun 23, 45
Sun-Spot Lines in the Spectrum of *Arcturus* 24, 69
ADAMS, WALTER S., and EDWIN B. FROST. See FROST and ADAMS
ADAMS, WALTER S., and GEORGE E. HALE. See HALE and ADAMS
ADAMS, WALTER S., GEORGE E. HALE, and HENRY G. GALE. See HALE, ADAMS, and GALE
AITKEN, R. G. Variations in the Spectrum of the *Orion* Nebula . 6, 365
ALBRECHT, SEBASTIAN. Photographic Observations of Comet 1903 *c* (Borrelly) 19, 121
On the Relation between Stellar Spectral Types and the Intensities of Certain Lines in the Spectra 24, 333
A Spectrographic Study of the Fourth Class Variable Stars *Y Ophiuchi* and *T Vulpeculae* 25, 330
On the Distortion of Photographic Films on Glass . . . 25, 349

	VOLUME AND PAGE
AMBRONN, L. Remarks on Mr. C. L. Poor's Papers on the Figure of the Sun	23, 343
AMES, J. S. Röntgen's X Rays	3, 294
Henry Augustus Rowland	13, 241
Marie-Alfred Cornu	15, 299
The Henry A. Rowland Memorial Library	17, 247
An Elementary Discussion of the Action of a Prism on White Light	22, 76
The Present Condition of Rowland's Ruling Machines	23, 348
Review of: *On the Spectrum of the Electric Discharge in Liquid Oxygen, Air and Nitrogen*, Liveing and Dewar	1, 88
Review of: *On Variations Observed in the Spectra of Carbon Electrodes, and on the Influence of One Substance on the Spectrum of Another*, W. N. Hartley	1, 88
Review of: *Flame Spectra at High Temperatures.* II and III, W. N. Hartley	1, 89
Review of: *Beiträge zur Kenntniss der Linien-Spectren*, J. R. Rydberg	1, 90
Review of: *Beiträge zur Kenntniss der Linien-Spectren*, H. Kayser und C. Runge	1, 90
Review of: *Ueber die Spectra von Zinn, Blei, Arsen, Antimon, Wismuth*, H. Kayser und C. Runge	1, 91
Review of: *The Spectrum Researches of J. M. Eder and E. Valenta.*	1, 443
Review of: *Ueber drei verschiedene Spectren des Argons. Ueber die Spectren von Kupfer, Silber und Gold*, Eder und Valenta	3, 396
Review of: *The Radiation of Uranium and Its Salts. Sur diverses propriétés des rayons uraniques.* Henri Becquerel	5, 66
Review of: *Mathematical and Physical Papers*, G. G. Stokes	23, 173
AMES, J. S., R. F. EARHART, and H. M. REESE. Notes on the Zeeman Effect	8, 48
AMES, J. S., and W. J. HUMPHREYS. On the Spectra of Heavy and Light Helium	5, 97
ANDERSON, J. A. Review of Stark's Theory of Radiation	24, 362
ANDERSON, W. B. A Spectroscopic Study of the Spark Spectrum	24, 221
ÅNGSTRÖM, KNUT. The Absolute Determination of the Radiation of Heat with the Electric Compensation Pyrheliometer with Examples of the Application of This Instrument	9, 332
The Mechanical Equivalent of the Unit of Light	15, 223
ARRHENIUS, SVANTE. On the Physical Nature of the Solar Corona	20, 224
ASCHKINASS, E., and H. RUBENS. See RUBENS and ASCHKINASS	
AUGUR, A. W. Review of: *Ueber die Ursache der Nordlichter*, Svante Arrhenius	13, 344

	VOLUME AND PAGE
BACKHOUSE, T. W. Photograph of "Flash" Spectrum	8, 198
BAEYER, O. VON. On the Structure of the Finest Spectral Lines	25, 267
BAILEY, S. I. On the Forms of the Disks of *Jupiter's* Satellites	2, 97
The Periods of the Variable Stars in the Cluster *Messier 5*	10, 255
Note on the Relation between the Visual and Photographic Light Curves of Variable Stars of Short Period	10, 261
BAKER, JOHN C., and HENRY CREW. See CREW and BAKER	
BALMER, J. J. A New Formula for the Wave-Lengths of Spectral Lines	5, 199
BALY, E. C. C. The Spectrum of the Aurora	19, 187
BALY, E. C. C., and C. H. DESCH. Ultra-Violet Absorption Spectra in Relation to Physico-Chemical Processes	23, 110
BALY, E. C. C., and A. W. STEWART. The Origin of Color	24, 133
See also STEWART and BALY	
BARNARD, E. E. Photographs of the Milky Way	1, 10
Photographs of the Milky Way near *15 Monocerotis* and near *ε Cygni*	2, 58
On a Photographic Search for a Satellite to the Moon	2, 347
Photograph of the Nebula *N. G. C.* 1499, near the Star *ξ Persei*	2, 350
Celestial Photographs with a "Magic Lantern" Lens	2, 351
Photographic and Visual Observations of Holmes's Comet	3, 41
Note on Professor Campbell's Observations of *Nova Aurigae*	5, 277
Physical and Micrometrical Observations of the Planet *Venus* Made at the Lick Observatory with the 12-Inch and 36-Inch Refractors	5, 299
Astronomical Photography with Small Lenses	6, 446
The Great Nebula of *Andromeda*	8, 226
Observations of the Leonid Meteors of 1898	9, 151
Photograph of the Milky Way near the Star *Theta Ophiuchi*	9, 157
Some Abnormal Stars in the Cluster of *M 13 Herculis*	12, 176
Discovery and Period of a Small Variable Star in the Cluster *M 13 Herculis*	12, 182
Review of: *A General Catalogue of 1290 Double Stars Discovered from 1871 to 1899*, S. W. Burnham	12, 228
Peculiarity of Focal Observations on the Planetary Nebulae and Visual Observations of *Nova Persei* with the 40-Inch Yerkes Telescope. (See also Errata, 14, 295.)	14, 151
Observations of the Aurora Made at the Yerkes Observatory, 1897–1902	16, 135
On the Change in the Focus for *Nova Persei*	16, 183
Comments on the Early Harvard Photographs of *Nova Persei*	16, 340
Diffused Nebulosities in the Heavens	17, 77
The South Polar Cap of *Mars*	17, 249

	VOLUME AND PAGE
BARNARD, E. E. (*Continued*)	
Observations of *Nova Geminorum*	17, 376
Photographic Observations of Borrelly's Comet and Explanation of the Phenomenon of the Tail on July 24	18, 210
Review of: *The Moon, A Summary of the Existing Knowledge of Our Satellite, with a Complete Photographic Atlas*, William H. Pickering	20, 359
The Bruce Photographic Telescope of the Yerkes Observatory	21, 35
On the Anomalous Tails of Comets	22, 249
Nova Aquilae of 1905	22, 358
A Great Photographic Nebula near π and δ *Scorpii*	23, 144
Note on Professor Newcomb's Observation of the Zodiacal Light	23, 168
The Midnight Illumination above the Northern Horizon near the Time of the Summer Solstice	24, 128
Photographic Observations of Giacobini's Comet (1905 *c*)	24, 255
On a Nebulous Groundwork in the Constellation of *Taurus*	25, 218
Nova T Coronae of 1866	25, 279
BARNARD, R. J. A. Note on the *Algol* System	23, 406
BARNES, JAMES. On the Analysis of Bright Spectrum Lines	19, 190
On the Spectrum of Magnesium	21, 74
Review of: *Analysis of the Spectrum Lines of Mercury, Cadmium, Sodium, Zinc, Thallium, and Hydrogen*, L. Janicki	24, 56
BARR, J. MILLER. The System of *Capella*. (See also Errata, 11, 415.)	11, 248
Spectroscopic Binaries: A Suggestion	15, 65
BARRETT, STORRS B. Review of: *History of Astronomy in the Nineteenth Century*. Fourth Edition, Agnes M. Clerke	18, 397
Review of: *A Popular Guide to the Heavens*, Robert S. Ball	24, 367
Review of Fabry and Buisson's Wave-Lengths of Standard Lines	25, 362
BASQUIN, OLIN H. Device for Putting Wave-Lengths on Spectrum Plates	1, 166
The Spectrum of Hydrogen Given by the Metallic Arc of Tin, Copper, Silver, etc.	14, 1
BASQUIN, O. H., and H. CREW. See CREW and BASQUIN	
BAXANDALL, F. E. On the Enhanced Lines of Iron, Titanium, and Nickel	21, 337
BELL, LOUIS. On the Discrepancy between Grating and Interference Measurements	15, 157
Note on the Nebula Surrounding *Nova Persei*	16, 38
The Perot-Fabry Corrections of Rowland's Wave-Lengths	18, 191
BELOPOLSKY, A. The Spectrum of δ *Cephei*	1, 160
On the Spectrographic Performance of the 30-Inch Pulkowa Refractor	1, 366

VOLUME AND PAGE

BELOPOLSKY, A. (*Continued*)
On the Performance of an Auxiliary Lens for Spectrographic Investigations with the 30-Inch Refractor of the Pulkowa Observatory 3, 147
On the Spectroscopic Binary α^1 *Geminorum* 5, 1
New Investigations of the Spectrum of β *Lyrae* 6, 328
Researches on the Spectrum of the Variable Star η *Aquilae* . 6, 393
Note on the Spectrum of *P Cygni* 10, 319
On an Apparatus for the Laboratory Demonstration of the Doppler-Fizeau Principle 13, 15
Spectrographic Observations of Standard Velocity Stars at Pulkowa 19, 85
On the Determination of Radial Velocities at Pulkowa . . 21, 55
BIGELOW, FRANK H. Preliminary Report from the Observations of 1899, Taken to Survey the Cloud Conditions of the Eclipse Track of 1900 . . . . . 10, 220
Reply to E. von Oppolzer's Remarks on Bigelow's "Eclipse Meteorology" 17, 161
BLYTHSWOOD, LORD, and WALTER A. SCOBLE. Photographs of Certain Arc Spectra from λ 5800 to λ 8500 . . . . 24, 125
BOYNTON, W. P. Review of: *The Dynamical Theory of Gases*, J. H. Jeans 22, 224
BRACE, D. B. Note on Steady Liquid Surfaces. (See also Errata, 5, 350.) 5, 214
On a New System for Spectral Photometric Work 11, 6
BROCA, ANDRÉ, and PH. PELLIN. See PELLIN and BROCA
BROWN, JULIUS A., and EDWIN B. FROST. See FROST and BROWN
BROWN, S. J. Preliminary Results of the United States Naval Observatory Eclipse Expedition, May 1900 . . . . . 12, 58
BURNS, GAVIN J. The Total Light of All the Stars 16, 166
The Proper Motions of the Stars 17, 63
BURNS, KEIVIN. Orbit of the Spectroscopic Binary λ *Andromedae* . 24, 345
BURTON, ALFRED E. Observations of the Total Solar Eclipse of May 28, 1900, by the Massachusetts Institute of Technology Party 12, 96
CALLENDAR, H. L. Letter Regarding Sunshine Recorders . 23, 167, 408
CAMPBELL, W. W. Recent Changes in the Spectrum of *Nova Aurigae* 1, 49
On Determining the Extent of a Planet's Atmosphere . . 1, 85
A Review of the Spectroscopic Observations of *Mars* . . 2, 28
A Spectrographic Determination of Velocities in the System of *Saturn* 2, 127
The Visible Spectrum of the Trifid Nebula 2, 161

	VOLUME AND PAGE
CAMPBELL, W. W. (*Continued*)	
Note on the Spectrum of the Aurora Borealis	2, 162
Observations of the B Band in Stellar Spectra	2, 163
Stars Whose Spectra Contain Both Bright and Dark Hydrogen Lines	2, 177
On Mr. Jewell's Observations of the Spectrum of *Mars*	4, 79
Spectroscopic Notes. (See also Errata, 5, 350.)	5, 233
On the Variations Observed in the Spectrum of the *Orion* Nebula	6, 363
The Mills Spectrograph of the Lick Observatory. (See also Errata, 8, p. vii.)	8, 123
Some Stars with Great Velocities in the Line of Sight	8, 157
The Variable Velocity of η *Pegasi* in the Line of Sight	8, 159
The Variable Velocity of o *Leonis* in the Line of Sight	8, 291
The Variable Velocity of χ *Draconis* in the Line of Sight	8, 292
The Purkinje Phenomenon and the Spectrum of the *Orion* Nebula	8, 317
Notes on the Spectrum of o *Ceti*	9, 31
The Variable Velocity of ζ *Geminorum* in the Line of Sight	9, 86
On the Visible Spectrum of *Nova Sagittarii*	9, 308
The Variable Velocity of ι *Pegasi* in the Line of Sight	9, 310
The Variable Velocity of θ *Draconis* in the Line of Sight	9, 311
A Comparison of the Visual Hydrogen Spectra of the *Orion* Nebula and of a Geissler Tube	9, 312
The Influence of the Purkinje Phenomenon on Observations of Faint Spectra	10, 22
The Spectroscopic Binary *Capella*	10, 177
The Variable Velocities in the Line of Sight of ϵ *Librae*, h *Draconis*, λ *Andromedae*, ϵ *Ursae Minoris*, and ω *Draconis*	10, 178
The Variable Velocity of α *Ursae Minoris* in the Line of Sight	10, 180
The Wave-Length of the Green Coronal Line, and Other Data Resulting from an Attempt to Determine the Law of Rotation of the Solar Corona. (See also Errata, 11, 169.)	10, 186
The Variable Velocities of β *Capricorni* and v *Sagittarii* in the Line of Sight	10, 241
The Variable Velocity of β *Herculis* in the Line of Sight	11, 140
The Determination of the Moon's Theoretical Spectrographic Velocity	11, 141
On the Probable Error of a Radial Velocity Determination	11, 167
Some Spectrographic Results Obtained at the Indian Eclipse by the Lick Observatory-Crocker Expedition	11, 226
The Temperature Control of the Mills Spectrograph	11, 259
James Edward Keeler	12, 239
The Visible Spectrum of *Nova Aquilae*	12, 258

VOLUME AND PAGE

CAMPBELL, W. W. (*Continued*)
A Preliminary Determination of the Motion of the Solar System 13, 80
The Motion of ζ *Geminorum* in the Line of Sight . . . 13, 90
Some Stars with Large Radial Velocities 13, 98
Some Recent Results Secured with the Mills Spectrograph . 14, 138
Observations of the Spectroscopic Binary η *Pegasi* . . . 14, 202
Observations of the Spectroscopic Binary *Capella* 14, 261
Six Stars Whose Velocities in the Line of Sight Are Variable . 16, 114
The Mirror of the Crossley Reflector—A Correction . . 16, 121
Review of: *Problems in Astrophysics*, Miss A. M. Clerke . . 18, 156
The Crocker Eclipse Expeditions in 1905 . . . . . 20, 235
Note Concerning the Publication of the Crossley Reflector Photographs of Nebulae and Star Clusters 20, 295
The Variable Radial Velocity of *Sirius* 21, 176
Note on the D. O. Mills Expedition to the Southern Hemisphere 23, 269
The Radial Velocity of *Polaris* 25, 59
CAMPBELL, W. W., and HEBER D. CURTIS. A List of Five Stars Whose Velocities in the Line of Sight Are Variable . . 18, 306
A List of Nine Stars Whose Radial Velocities Vary . . . 21, 185
On the Radial Velocities of *Polaris*, η *Piscium*, ε *Aurigae*, and β *Orionis* 21, 191
CAMPBELL, W. W., and J. H. MOORE. A List of Eight Stars Whose Radial Velocities Are Variable 25, 54
CAMPBELL, W. W., and W. H. WRIGHT. A List of Nine Stars Whose Velocities in the Line of Sight Are Variable . . . 12, 254
Observations of the Spectrum of *Nova Persei* 14, 269
CAPPS, E. V. Calibration of the Slit in Spectral Photometric Measurements 11, 25
CHAMBERLIN, T. C. On a Possible Function of Disruptive Approach in the Formation of Meteorites, Comets, and Nebulae . 14, 17
CHANT, C. A. Some New Determinations of the Reflecting Powers of Glass and Silvered Glass Mirrors 21, 211
CHESTER, COLBY M. Preliminary Results of the United States Naval Observatory Expedition in 1905 . . . . . 23, 128
CHEVALIER, S. On the Brightness of the Inner Edge of the Penumbra in Sun-Spots 24, 278; 25, 273
CLOUGH, H. W. Synchronous Variations in Solar and Terrestrial Phenomena 22, 42
COBLENTZ, WILLIAM W. Preliminary Communication on the Infra-Red Absorption Spectra of Organic Compounds . . 20, 207
Review of: *Handbuch der Spectroscopie*. III, H. Kayser . . 22, 281
Regular and Diffuse Reflection 25, 282

	VOLUME AND PAGE
COIT, J. B. Observations of Solar Eclipse, May 28, 1900, at Wadesboro, N. C.	12, 97
COMSTOCK, GEORGE C. On the Application of Interference Methods to the Determination of the Effective Wave-Length of Starlight	5, 26
Research Work at the Washburn Observatory	6, 419
Observations of the Leonid Meteors, November 10–16, 1898	9, 15
The Third Conference of Astronomers and Astrophysicists	10, 58
The Mass of *85 Pegasi*	17, 220
A Proposed Method for the Determination of Radial Velocities of Stars	23, 148
The Luminosity of the Brightest Stars	23, 248
COMSTOCK, GEORGE C., and JOEL STEBBINS. Observations of the Brightness of *Nova Persei*	13, 336
COOK, S. R. On the Escape of Gases from Planetary Atmospheres According to the Kinetic Theory	11, 36
CORNU, M. A. On the Observation and Kinematic Interpretation of the Phenomena Discovered by Dr. Zeeman	6, 378
On Certain New Results Relating to the Phenomena Discovered by Dr. Zeeman	7, 163
On the Law of Diurnal Rotation of the Optical Field of the Siderostat and Heliostat	11, 148
The Atmospheric Absorption of the Visible Rays, Determined from Spectroscopic Observations of the Eiffel Tower Electric Lights in 1889	13, 142
CORTIE, A. L. On the Level of Sun-Spots and the Cause of Their Darkness	7, 239
On the Types of Sun-Spot Disturbances	13, 260
On Drift in Longitude of Groups of Faculae on the Sun's Surface	14, 317
Minimum Sun-Spots and Terrestrial Magnetism	16, 203
Solar Prominences and Terrestrial Magnetism	18, 287
The Spectra of Sun-Spots in the Red and Yellow Regions of the Spectrum	20, 253
On the Connection between Disturbed Areas of the Solar Surface and the Solar Corona	24, 355
COTTON, A. The Present Status of Kirchhoff's Law	9, 237
CRAWFORD, RUSSELL TRACY. The Orbit of the Spectroscopic Binary *η Pegasi*	14, 203
CREW, HENRY. Photographic Maps of Metallic Spectra	2, 318
Normal Spectrum of Zinc Arc	4, 135
Studies of the Electric Arc	6, 418
A Provisional List of Photometric Units	7, 298
Robert Wilhelm Bunsen	10, 301

	VOLUME AND PAGE
CREW, HENRY (*Continued*)	
On the Arc-Spectra of Some Metals as Influenced by an Atmosphere of Hydrogen	12, 167
Effect of Self-Induction upon Spark-Spectra of Metalloids	16, 59
Note on the Wave-Length of the Magnesium Line at λ 4481	16, 246
On the Conditions Which Govern the Appearance of Spark Lines in Arc Spectra	20, 274
Remarks on Standard Wave-Lengths	20, 313
Review of: *The Luminosity of Gases.* III, A. Smithells	1, 266
Review of: *Popular Scientific Lectures*, Ernst Mach	1, 267
Review of: *Zur Theorie der Verbreiterung der Spectrallinien*, Fürst B. Galitzin	2, 324
Review of: *Molecules and the Molecular Theory of Matter*, A. D. Risteen	2, 392
Review of: *Ueber Gesetzmässigkeiten in den Spectren festen Körper*, F. Paschen	5, 60
Review of: *Experimental Determinations of the Temperature in Geissler Tubes*, R. W. Wood	5, 63
Review of: *Ueber einen Versuch eine electrodynamische Sonnenstrahlung, und über die Aenderung des Uebergangswiederstand bei Berührung zweier Leiter durch electrische Bestrahlung*, J. Wilsing und J. Scheiner	5, 219
Review of: *Ueber die ultravioletten Funkenspectra der Elemente*, Franz Exner und E. Haschek	5, 290
Review of: *Elementary Text-Book on Physics*, Anthony and Brackett	5, 360
Review of: *Ueber einige Emissionsspectra des Cadmiums, Zinks, und der Haloid Verbindungen des Quecksilbers und einiger anderen Metallen*, A. C. Jones; *The Multiple Spectra of Gases*, John Trowbridge and Theodore Wm. Richards; *On the Propagation of Waves along Connected Systems of Similar Bodies*, Lord Rayleigh; *On a Relation between the Spectrum of Hydrogen and Acoustics*, A. S. Herschel	7, 150
Review of Professor J. J. Thomson's Work on the Structure of the Atom	11, 170
Review of: *Recherches expérimentales sur les spectres d'étincelles*, G. A. Hemsalech	14, 370
Review of: *Handbuch der Spectroscopie.* Band I, H. Kayser	15, 150
Review of: *Lehrbuch der Physik.* Band I, O. D. Chwolson	18, 396
Review of: *Atlas of Emission Spectra of Most of the Elements*, A. Hagenbach and H. Konen	22, 226
Review of: *Spectroscopy*, E. C. C. Baly	23, 170
Review of: *Vorlesungen über theoretische Spektroskopie*, A. Garbasso	24, 303

	VOLUME AND PAGE
CREW, HENRY, and JOHN C. BAKER. On the Thermal Development of the Spark Spectrum of Carbon	16, 61
CREW, H., and O. H. BASQUIN. Note on the Magnesium Band at λ 5007	2, 100
Note on the Spectrum of Carbon	2, 103
CREW, H., and B. J. SPENCE. Variation of Arc Spectra with Phase of the Current Producing Them	22, 199
CROCKETT, C. W. The Caustic of the Right Parabolic Cylinder	7, 358
The Parabolic Mirror	7, 362
Observations of Total Eclipse, May 28, 1900, at Juliette, Ga.	12, 92
CROOKES, W. The Spectrum of Helium	1, 439; 2, 227
CURTIS, HEBER D. Visual Observations of the Spectrum of *Nova Geminorum* Made with the 36-Inch Refractor	19, 83
Definitive Orbit of the Spectroscopic Binary ι *Pegasi*	19, 212
The System of *Castor*	23, 351
CURTIS, HEBER D., and W. W. CAMPBELL. See CAMPBELL and CURTIS	
CURTIS, HEBER D., and H. M. REESE. See REESE and CURTIS	
CURTISS, RALPH H. I. A Method of Measurement and Reduction of Spectrograms for the Determination of Radial Velocities. II. Application to a Study of the Variable Star *W Sagittarii*	20, 149
The Radial Velocities of *S Sagittae* and *Y Sagittarii*	20, 231
On the Spectra of *R Scuti* and *W Cygni*	20, 232
On the Computation of the Moon's Spectrographic Velocity near Full Moon	21, 376
On the Light and Velocity Curves of *W Sagittarii*	22, 274
DANIEL, F. C., and J. F. MOHLER. See MOHLER and DANIEL	
DANIEL, ZACCHEUS, and J. A. PARKHURST. See PARKHURST and DANIEL	
DARWIN, HORACE. An Electric Thermostat	20, 347
DAY, ARTHUR L., and C. E. VAN ORSTRAND. The Black Body and the Measurement of Extreme Temperatures	19, 1
DE GRAMONT, A. A Graphical Study of Refraction and Dispersion.	13, 208
Silicon Lines in Spark and Stellar Spectra	20, 233
DESCH, C. H., and E. C. C. BALY. See BALY and DESCH	
DESLANDRES, H. Remarks on the Methods Employed in the Determination of the Radial Velocities of the Stars	9, 167
Observations of the Total Solar Eclipse of May 28, 1900, at Argamasilla, Spain	12, 287
First Results of Investigations on the Observation of the Solar Corona without an Eclipse by Means of the Heat Rays	12, 366
DOBBIN, EMILY ELISABETH. Line of Sight Constants for Some Stars of the *Orion* Type	19, 382

VOLUME AND PAGE

DOBERCK, W. On the Magnitudes of 919 Fixed Stars Determined from Sequences Observed by Sir John Herschel during the Years 1835 to 1838. . . . . 11, 192, 270
DOOLITTLE, CHARLES L. The Latitude Work of the Flower Observatory 6, 429
DORSEY, N. ERNEST. Review of Papers on Color-Photography . 5, 291
Comparison of a Prism and a Grating Spectroscope . . . 12, 164
DOUGLASS, A. E. A Cloud-like Spot on the Terminator of *Mars* . 1, 127
A Combination Telescope and Dome 1, 401
DOWNING, A. M. W., and G. JOHNSTONE STONEY. See STONEY and DOWNING
DUNÉR, N. C. On the Periodic Changes of the Variable Star *Z Herculis* 1, 285
On the Variable Star *Z Herculis* 3, 348
On the Spectra of Stars of Class III*b* 9, 119
Calculation of Elliptic Elements of the System of *Y Cygni* . 11, 175
Observations and Ephemerides of the Variable Star *Y Cygni* . 14, 149
Tobias Robert Thalén 22, 341
DUNÉR, HARTWIG, MÜLLER, and OUDEMANS. Publication of a New Catalogue of Variable Stars 14, 214
DUNSTAN, A. ST. C. Review of: *Sur une nouvelle méthode de spectroscopie interférentielle; Étude de quelques radiations par la spectroscopie interférentielle*, A. Perot et Ch. Fabry . 8, 60
EARHART, R. F., J. S. AMES, and H. M. REESE. See AMES, EARHART, and REESE
EASTON, C. On the Distribution of the Stars and the Distance of the Milky Way in *Aquila* and *Cygnus* 1, 216
A New Theory of the Milky Way 12, 136
EBERHARD, G. On the Spectrum and Radial Velocity of χ *Cygni* . 18, 198
A Spectroscopic Investigation of Dr. Urbain's Preparations of Terbium 24, 309
Systematic Errors in the Wave-Lengths of the Lines of Rowland's Solar Spectrum 17, 141
EBERHARD, G., and J. HARTMANN. See HARTMANN and EBERHARD
EBERT, H. On the Electromagnetic Nature of the Solar Radiation and on a New Determination of the Temperature of the Sun 2, 55
EDDIE, L. A. The Short Period Variable δ *Cephei* . . . 3, 227
EDER, J. M., and E. VALENTA. On the Invariability of the Wave-Lengths in the Spark and Arc Spectrum 19, 251
ELKIN, W. L. Photographic Observations of the Leonids at the Yale Observatory 9, 20
Photographic Observations of the Leonids of 1898 at the Yale Observatory 10, 25

VOLUME AND PAGE

ELKIN, W. L. (*Continued*)
The Velocity of Meteors as Deduced from Photographs at the Yale Observatory 12, 4
ELLERMAN, FERDINAND, and GEORGE E. HALE. See HALE and ELLERMAN
ELLERY, R. L. J. Observations of *Mars* Made in May and June 1894, with the Melbourne Great Telescope 1, 47
ELSTON, T. SIDNEY. Recent Formulae for Distribution of Spectrum Lines in Series 23, 162
A Theory for the Distribution of Spectral Lines in Series . . 23, 346
The Fluorescent and Absorption Spectra of Anthracene and Phenanthrene Vapors 25, 155
EMDEN, R. Contributions to the Solar Theory 15, 38
ESPIN, T. E. Red Star Discovered at Wolsingham Observatory . 1, 87
On the Variability of *Es.-Birm.* 281 . . . . . 1, 351
The Position of the Stars of Type IV and of the Variable Stars of Type III in Reference to the Milky Way 10, 169
EVERSHED, J. The Cause of the Darkness of Sun-Spots . . 5, 244
Wave-Length Determinations and General Results Obtained from a Detailed Examination of Spectra Photographed at the Solar Eclipse of January 22, 1898 . . . . . 13, 223
EXNER, FRANZ, and EDUARD HASCHEK. Note on the Spectrum of Silicon 12, 48
EXNER, KARL, and W. VILLIGER. The Optical Power of the Atmosphere and Its Measurement 21, 368
FABRY, CHARLES. On the Wave-Length of the Cadmium Line at λ 5086 . . . . . 19, 116
On the Spectra of the Alkaline-Earth Fluorides in the Electric Arc 21, 356
FABRY, CH., and A. PEROT. On a New Form of Interferometer . 13, 265
Measures of Absolute Wave-Lengths in the Solar Spectrum and in the Spectrum of Iron 15, 73, 261
On the Corrections to Rowland's Wave-Lengths 19, 119
See also PEROT and FABRY
FÉNYI, J. On a Very Large Protuberance Observed December 24, 1894 . . . . . 1, 212
On Two Solar Protuberances Observed July 15 and September 30, 1895 . . . . . 3, 192
A New Point of View for Regarding Solar Phenomena, and a New Explanation of the Appearances on the Surface of the Sun . 4, 18
Prominences Observed on August 8, 1896. (See also Errata 6, 58.) 4, 263
The Great Sun-Spot of September 1898 . . . . . 10, 333
Prominences Observed at Kalocsa on May 28, 1900 . . . 12, 24

VOLUME AND PAGE

FÉNYI, J. (*Continued*)
Rise of a Large Prominence on June 1, 1900 . . . . . 12, 215
Michelson's Theory of the Displacement of Spectral Lines . 19, 70
FESSENDEN, REGINALD A. Outline of an Electrical Theory of Comets' Tails 3, 36
Review of: *On the Electrolysis of Gases*, J. J. Thomson . . 2, 394
FITZGERALD, GEORGE F. Note on a Cause for the Shift of Spectral Lines 5, 210
The Velocity of Meteors 9, 50
FITZGERALD, G. F., and W. E. WILSON. See WILSON and FITZGERALD
FLEMING, M. Stars Having Peculiar Spectra. Eleven New Variable Stars 1, 411
Seven New Variable Stars 2, 198
Stars Having Peculiar Spectra. Eight New Variable Stars in *Cetus*, *Vela*, *Centaurus*, *Lupus*, *Scorpio*, *Aquila*, and *Pegasus* 2, 354
FOWLE, FREDERICK E., and CHARLES G. ABBOT. See ABBOT and FOWLE
FOWLER, A. Note on Additional Triplets in the Arc Spectrum of Strontium 21, 81
FOWLER, A., and H. SHAW. On Formulae for Spectrum Series . 18, 21
FOX, PHILIP. The Spectrum of Lightning 18, 294
Observations with the Rumford Spectroheliograph . . . 21, 351
FRIČ, JOSEF JAN. Note on Meteor Photography 10, 130
FROST, EDWIN B. Note on a Differential Method of Determining the Velocity of Stars in the Line of Sight 2, 235
Note on Helium in β *Lyrae* 2, 383
On the Level of Sun-Spots 4, 196
Notes on New Gases in the Earth's Atmosphere . . . 8, 121
The Variable Velocity of *Polaris* 10, 184
On Titanium for a Comparison Spectrum 10, 207
Corrections to Determinations of Absolute Wave-Length . . 10, 283
Spectroscopic Results Obtained at the Solar Eclipse of May 28, 1900 12, 307
The Bruce Spectrograph of the Yerkes Observatory . . 15, 1
The Spectroscopic Binary β *Cephei* 15, 340
Wave-Lengths of Certain Lines of the Second Spectrum of Hydrogen 16, 100
Co-operation in Observing Radial Velocities of Selected Stars . 16, 169
Radial Velocity of *T Vulpeculae* 20, 296
A Desideratum in Spectrology 20, 342
Ernst Abbe 21, 379
Spectrographic Observations of Certain Variable Stars . . 22, 213
Walter F. Wislicenus 22, 345

	VOLUME AND PAGE
FROST, EDWIN B. (*Continued*)	
Spectrographic Observations	23, 264
The Snow Fund of the Yerkes Observatory	24, 219
The Period of β *Cephei*	24, 259
Georges Rayet	25, 53
Nine Stars Having Variable Radial Velocities	25, 59
Review of: *The Total Eclipse of April 16, 1893. Report on Results Obtained with the Slit Spectroscopes*, E. H. Hills	1, 91
Review of: *Preliminary Report on the Results Obtained with the Prismatic Camera During the Total Eclipse of the Sun, April 16, 1893*, J. Norman Lockyer	1, 91
Review of: *Étude sur le spectre de l'étoile variable δ Cephei*, A. Belopolsky	1, 263
Review of: *Untersuchungen über die Spectra der helleren Sterne*, J. Scheiner	2, 386
Review of: *Spectroscopy of Binary Systems*, T. J. J. See	3, 232
Review of: *Die Schwankungen im Wasserdampfgehalte der Atmosphäre auf Grund spectroskopischer Untersuchungen*, Th. Arendt	5, 152
Note on Dr. Arendt's Spectroscopic Investigation of the Variation of Aqueous Vapor in the Atmosphere.	6, 57
Review of: *Die Photometrie der Gestirne*, G. Müller	7, 311
Review of: *Untersuchungen über die Spectra von 528 Sternen*, H. C. Vogel und J. Wilsing	10, 362
Review of: *Comparative Photographic Spectra of Stars to the $3\frac{1}{2}$ Magnitude; Spectra of Southern Stars*, Frank McLean	10, 367
Review of: *Publicationen des Astrophysikalischen Observatoriums zu Potsdam; Photographische Himmelskarte*, Band I	12, 297
Review of: *Strahlung und Temperatur der Sonne*, J. Scheiner	12, 303
Review of: *Wellenlängen-Tabellen für spektralanalytische Untersuchungen, auf Grund der ultravioletten Funkenspektren der Elemente*, Franz Exner und E. Haschek	19, 302
Review of: *Index to the Literature of the Spectroscope* (1887–1900), Alfred Tuckerman	22, 162
Review of: *Lehrbuch der Physik*. Bd. II, O. D. Chwolson	22, 227
Review of: *Beiträge zur Photochemie und Spectralanalyse*, J. M. Eder und E. Valenta	23, 171
Review of: *Newcomb-Englemanns Populäre Astronomie*, H. C. Vogel	23, 174
Review of: *An Introduction to the Study of Spectrum Analysis*, W. Marshall Watts	23, 177
Review of: *Sternverzeichnis enthaltend alle Sterne bis zur 6.5ten Grösse für das Jahr 1900*, J., R., und L. Ambronn	25, 153

VOLUME AND PAGE

FROST, EDWIN B., and WALTER S. ADAMS. Wave-Lengths of Certain Oxygen Lines 16, 119
Five Stars Whose Radial Velocities Vary 17, 150
Additional Stars of the *Orion* Type Whose Radial Velocities Vary 17, 246
Two Stars with Variable Radial Velocities 17, 381
Spectrographic Observations of Standard Velocity Stars (1902–1903) 18, 237
Ten Stars Whose Radial Velocities Vary 18, 383
Eight Stars Whose Radial Velocities Vary 19, 151
Observations with the Bruce Spectrograph 19, 350
FROST, EDWIN B., and JULIUS A. BROWN. Wave-Lengths of Certain Silicon Lines 22, 157
GALE, HENRY G. Review of: *Physical Optics*, Robert W. Wood . 25, 290
GALE, HENRY G., GEORGE E. HALE, and WALTER S. ADAMS. See HALE, ADAMS, and GALE
GERRISH, WILLARD P. Photographic Observations of Eclipses of *Jupiter's* Satellites 1, 146
GIESING, ERNST. Investigations on Plane Reflection Gratings with Reference to Their Use in the Absolute Determination of Wave-Lengths 25, 237
GILL, DAVID. On the Presence of Oxygen in the Atmospheres of Certain Fixed Stars. (See also Errata, 11, 169.) . . 10, 272
GODFREY CHARLES. Note on Professor Wilsing's Article on the Effect of Pressure on Wave-Length 8, 114
GRAMONT, A. DE. A Graphical Study of Refraction and Dispersion 13, 208
Silicon Lines in Spark and Stellar Spectra 20, 233
HAGEN, JOHN G. On the Meaning of the Star Magnitudes of Father Hagen's Atlas of Variable Stars 6, 441
Report on a New Edition of the Northern Durchmusterung Charts 7, 145
A Specimen Chart from the *Atlas Stellarum Variabilium* . . 8, 160
Observations of the Eclipse of May 28, 1900, by the Georgetown College Party 12, 101
Second Chart and Catalogue for Observing *Nova Persei* . . 13, 233
Discussion of a Questionable Type of Temporary Stars . . 17, 281
Variable Stars in Nebula of *Orion* in Connection with Chart for *T Orionis* 19, 344
The Atlas Chart for *T Orionis* Extended 20, 351
HAGEN, JOHN G., EDWARD C. PICKERING, and M. B. SNYDER. See PICKERING, HAGEN, and SNYDER
HAGENBACH, A., and H. KONEN. See KONEN and HAGENBACH
HALE, GEORGE E. The Astrophysical Journal 1, 80
Spectro-Bolographic Investigations at the Smithsonian Astrophysical Observatory 1, 162

VOLUME AND PAGE

HALE, GEORGE E. (*Continued*)

On a New Method of Mapping the Solar Corona without an Eclipse 1, 318
A Large Eruptive Prominence 1, 433
On a Photographic Method of Determining the Visibility of Interference Fringes in Spectroscopic Measurements . . 1, 435
Note on the Exposure Required in Photographing the Solar Corona without an Eclipse 1, 438
Terrestrial Helium (?) 1, 439
Notes on Schmidt's Theory of the Sun (Communicated by E. J. Wilczynski) 2, 69
On the Presence of Helium in Clèveite. 2, 76
Note on the Huggins Method of Photographing the Solar Corona without an Eclipse 2, 77
Note on the D_3 Line in the Spectrum of the Chromosphere . 2, 165
On the Wave-Length of the D_3 Line in the Spectrum of the Chromosphere 2, 384
Note on the Application of Messrs. Jewell, Humphreys, and Mohler's Results to Certain Problems of Astrophysics . 3, 156
The Effect of a Total Eclipse of the Sun on the Visibility of the Solar Prominences 3, 374
Mode of Printing Tables of Wave-Lengths 4, 306
On the Comparative Value of Refracting and Reflecting Telescopes for Astrophysical Investigations 5, 119
Note on the Ranyard Mounting for Reflecting Telescopes . 5, 148
Note on a Form of Spectroheliograph Suggested by Mr. H. F. Newall 5, 211
Award of the Gold Medal of the Royal Astronomical Society to Professor Barnard 5, 215
Note on the Relative Frequency of the H and K Lines in the Spectrum of the Chromosphere 6, 157
Note on the Level of Sun-Spots 6, 366
On the Presence of Carbon in the Chromosphere . 6, 412; 10, 287
The Total Solar Eclipse (1898) 7, 304
A New Director of the Lick Observatory 7, 310
The Harvard Conference of Astronomers and Astrophysicists 8, 54, 193, 229
Election of Edwin Brant Frost as Professor of Astrophysics at the Yerkes Observatory 8, 59
Parallax of the *Andromeda* Nebula. Spectrum of *Saturn's* Rings 9, 184
Spectra of Stars of Secchi's Fourth Type 9, 271
Comparison of Stellar Spectra of Third and Fourth Types . 9, 273
Period and Elongation Distance of the Fifth Satellite of *Jupiter* 9, 358
Heat Radiation of the Stars 9, 360

VOLUME AND PAGE

HALE, GEORGE E. (*Continued*)

The New Allegheny Observatory 9, 362
The Third Conference of Astronomers and Astrophysicists . 10, 211
Carbon in the Chromosphere 10, 287
Some New Forms of Spectroheliographs 10, 288
Solar Eclipse Problems 11, 47
Variable Star Observations with the 12-Inch and 40-Inch Refractors 12, 52
Observations of the Total Solar Eclipse of May 28, 1900, at Wadesboro, N. C. (See also Errata, 12, 238.) . . . 12, 80
Photographs of Star Clusters Made with the Forty-Inch Visual Telescope. (See also Errata, 12, 238.) 12, 161
On Some Attempts to Detect the Solar Corona in Full Sunlight with a Bolometer 12, 372
Appointment of Professor W. W. Campbell as Director of the Lick Observatory 12, 381
The New Star in *Perseus* 13, 173
Changes in the Spectrum of *Nova Persei* 13, 238
Note on the Spark Spectrum of Iron in Liquids and in Air at High Pressures 15, 132; 17, 154
Selective Absorption as a Function of Wave-Length . . . 15, 227
Solar Research at the Yerkes Observatory 16, 211
The New Star in *Gemini* 17, 300
An Expedition for Solar Research 19, 385
Co-operation in Solar Research 20, 306
A Study of the Conditions for Solar Research at Mount Wilson, California 21, 124
The Solar Observatory of the Carnegie Institution of Washington 21, 151
The Work of the Rumford Spectroheliograph 21, 261
A Programme of Solar Research 23, 1
Some Tests of the Snow Telescope 23, 6
Reply to Recent Statements by M. Deslandres 23, 92
The Spectroscopic Laboratory of the Solar Observatory . . 24, 61
Latitude and Longitude of the Solar Observatory . . . 24, 129
A 100-Inch Mirror for the Solar Observatory 24, 214
A Vertical Coelostat Telescope 25, 68
The Heliomicrometer 25, 293
Some New Applications of the Spectroheliograph . . . 25, 311
Note on the Yerkes Observatory 2, 74
Organization of the Yerkes Observatory 3, 215
Dedication of the Yerkes Observatory . . . 6, 58, 262, 353
Completion of Yerkes Telescope 6, 147
The Aim of the Yerkes Observatory 6, 310

	VOLUME AND PAGE
HALE, GEORGE E. (*Continued*)	
The Yerkes Observatory of the University of Chicago	
I. Selection of the Site	5, 164
II. The Building and Minor Instruments	5, 254
III. The Instrument and Optical Shops, and the Power House	5, 310
IV. The Forty-Inch Telescope, Dome, and Rising Floor	6, 37
Opportunities for Students at the Yerkes Observatory	9, 272
Latitude and Longitude of the Yerkes Observatory	14, 146
The Snow Horizontal Telescope of the Yerkes Observatory	17, 314
Arthur Cowper Ranyard	1, 168
Étienne-Léopold Trouvelot	2, 166
Alvan Graham Clark	6, 136
Catherine Wolfe Bruce	11, 168
James Edward Keeler	12, 102
Review of: *Publications of the Lick Observatory*, Volume III	1, 180
Review of: *The Sun*, Charles A. Young	3, 235
Review of: *Observations des protubérances solaires faites à l'Observatoire d'Odessa*, A. Kononowitsch, N. Zwietinowitsch and A. Orbinskij	3, 241
Review of: *Observations de l'eclipse totale du soleil du 16 avril, 1893*, H. Deslandres	4, 160
Review of: *Total Eclipse of the Sun, April 16, 1893*, J. Norman Lockyer	5, 220
Review of: *Analyse spectrale directe des minèraux*, Arnaud de Gramont	5, 362
Review of: *Annales de l'Observatoire d'Astronomie Physique de Paris*, Tome Premier	10, 369
Review of: *The Indian Eclipse.* Edited by E. Walter Maunder. Published by the British Astronomical Association	10, 374
Review of: *An Atlas of Representative Stellar Spectra*, Sir William and Lady Huggins	12, 291
Review of: *Annals of the Astrophysical Observatory of the Smithsonian Institution.* Vol. I, S. P. Langley	13, 280
Review of: *Handbuch der astronomischen Instrumentenkunde*, L. Ambronn	15, 347
Review of: *Handbuch der Spectroscopie* (2), H. Kayser	19, 296
HALE, GEORGE E., and WALTER S. ADAMS. Photographic Observations of the Spectra of Sun-Spots. (See also Errata, 23, 180.)	23, 11
Sun-Spot Lines in the Spectra of Red Stars	23, 400
Second Paper on the Cause of the Characteristic Phenomena of Sun-Spot Spectra	25, 75

VOLUME AND PAGE

HALE, GEORGE E., and WALTER S. ADAMS (*Continued*)
A Photographic Comparison of the Spectra of the Limb and the Center of the Sun 25, 300
HALE, GEORGE E., WALTER S. ADAMS, and HENRY G. GALE. Preliminary Paper on the Cause of the Characteristic Phenomena of Sun-Spot Spectra 24, 185
HALE, GEORGE E., and FERDINAND ELLERMAN. On the Spectra of Stars of Secchi's Fourth Type. (See also Errata 10, 299.) 10, 87
Calcium and Hydrogen Flocculi 19, 41
The Five-Foot Spectroheliograph of the Solar Observatory . 23, 54
HALE, GEORGE E., and NORTON A. KENT. Second Note on the Spark Spectrum of Iron in Liquids and Compressed Gases . . 17, 154
HALE, GEORGE E., and F. L. O. WADSWORTH. The Modern Spectroscope. XIX. The Objective Spectroscope 4, 54
HALM, J. On Spectroscopic Observations of the Rotation of the Sun 22, 150
HARRER, HENRY. Results of an Examination of Spectrograms of α *Orionis* Obtained during the Recent Irregular Minimum . 10, 290
HARRISON, CALEB N., and HENRY A. ROWLAND. See ROWLAND and HARRISON
HARTLEY, W. N. On the Probable Origin of Some of the Lines Observed in the Spectra of Stars and of the Chromosphere . 11, 163
HARTLEY, W. N., and HUGH RAMAGE. A Determination of the Wave-Lengths of the Principal Lines in the Spectrum of Gallium, Showing Their Identity with Two Lines in the Solar Spectrum 9, 214
A Spectrographic Analysis of Iron Meteorites, Siderolites, and Meteoric Stones 9, 221
HARTMANN, J. A Simple Interpolation Formula for the Prismatic Spectrum. (See also Errata, 11, 169.) 8, 218
On the Scale of Kirchhoff's Solar Spectrum 9, 69
On the Relative Brightness of the Planets *Mars* and *Jupiter*, from Measurements with a New Photometer 10, 225
Apparatus and Method for the Photographic Measurement of the Brightness of Surfaces 10, 321
Remarks on the Construction and Adjustment of Spectrographs 11, 400; 12, 30
The Motion of *Polaris* in the Line of Sight 14, 52
The Apparatus for the Electric Heating of the Potsdam Spectrograph No. III 15, 172
Spectrographic Measures of the Velocities of Gaseous Nebulae . 15, 287
On a New Relationship between Arc and Spark Spectra . . 17, 270
The Wave-Lengths of the Silicon Lines λ 4128 and λ 4131 and of the Carbon Line λ 4267 . . . . . 18, 65
A Revision of Rowland's Wave-Lengths. (See also Errata, 19, 84.) 18, 167

VOLUME AND PAGE

HARTMANN, J. (*Continued*)
Investigations on the Spectrum and Orbit of δ *Orionis* . . 19, 268
The Correction of the Standards of Wave-Lengths . . . 20, 41
On a New Method for the Measurement of Stellar Spectra . 20, 338
Monochromatic Photographs of the *Orion* Nebula . . . 21, 389
The Spectrocomparator 24, 285
HARTMANN, J., and G. EBERHARD. On the Occurrence of Spark Lines in Arc Spectra 17, 229
HARTWIG, MÜLLER, OUDEMANS, and DUNÉR. See under DUNÉR
HARZER, PAUL. Remarks on the Articles of Mr. E. J. Wilczynski in this Journal, Vol. 4, No. 2. (See also Errata, 5, 278.) . 5, 36
HASCHEK, EDUARD. Spectroscopic Studies. I 14, 181
HASCHEK, EDUARD, and FRANZ EXNER. See EXNER and HASCHEK
HASCHEK, EDUARD, and HEINRICH MACHE. On the Pressure in the Spark 9, 347; 12, 50
HASSELBERG, B. Researches on the Arc-Spectra of the Metals.
II. The Spectrum of Titanium 4, 116, 212
III. Cobalt and Nickel 4, 288, 343; 5, 38
V. Vanadium. (See also Errata, 11, 169.) . 10, 343; 11, 67
VI. Molybdenum 16, 300; 17, 20
On the Occurrence of Vanadium in Scandinavian Rutile . . 5, 194
Note on the Chemical Composition of the Mineral Rutile . . 6, 22
Note on the Presence of Vanadium in Rutile 6, 369
On the Wide Cosmical Dissemination of Vanadium . . . 9, 143
Note on a Personal Equation in Measuring Photographic Spectra 15, 208
HASTINGS, CHARLES S. On a New Type of Telescope Objective Especially Adapted for Spectroscopic Use 9, 162
Armand Fizeau 4, 367
HEDRICK, JOHN T. The Photochronograph 6, 435
HIGGS, GEORGE. The Photographic Normal Solar Spectrum . . 7, 86
Some Remarks on Dr. O. C. Lester's Contribution "On the Oxygen Absorption Bands of the Solar Spectrum" . . 22, 346
HINKS, ARTHUR R. The Movements in the Nebula Surrounding *Nova Persei* 16, 198
HOFFMAN, SAMUEL V. Note on the Use of Cylinder Oils for Reflecting Surfaces 3, 293
HOLDEN, EDWARD S. A Large Reflector for the Lick Observatory . 1, 442
HOUGH, G. W. Jovian Phenomena 6, 443
HOWE, H. A. A Correction 17, 163
HUFF, WILLIAM B. The Spectra of Mercury 12, 103
The Shift of the Cadmium Line of Wave-Length 4800 Due to Pressure 14, 41
The Arc Spectrum with Heavy Currents 16, 27

VOLUME AND PAGE

HUGGINS, MARGARET LINDSAY. "... Teach Me to Name the .... Light" 8, 54
Agnes Mary Clerke 25, 226
HUGGINS, SIR WILLIAM. Note on the Atmospheric Bands in the Spectrum of *Mars* 1, 193
The Modern Spectroscope. XII. The Tulse Hill Ultra-Violet Spectroscope 1, 359
On an Automatic Arrangement for Giving Breadth to Stellar Spectra on a Photographic Plate 5, 8
On the Mode of Printing Maps of Spectra and Tables of Wave-Lengths 6, 55
"A Suggested Explanation of the Solar Corona" 12, 279
Motion in the Line of Sight 14, 369
HUGGINS, SIR WILLIAM and LADY. On the Relative Behavior of the H and K Lines of the Spectrum of Calcium . . 6, 77
Spectroscopic Notes 6, 322
Preliminary Note on Some Modifications of the Magnesium Line at λ 4481 under Different Laboratory Conditions of the Spark-Discharge 17, 145
On the Spectrum of the Spontaneous Luminous Radiation of Radium at Ordinary Temperatures . 18, 151, 390; 22, 204; 23, 152
Note on the Interpretation of the Spectra of the Components of Double Stars Showing Contrasted Colors . . . 25, 65
HULL, G. F. On the Action of Coherers 6, 141
On the Analysis of Electric Radiation 6, 455
William A. Rogers 7, 390
An Investigation of the Influence of Electrical Fields upon Spectral Lines 25, 1
Doppler Effects and Polarization in Canal Rays 25, 234
HULL, G. F., and E. F. NICHOLS. See NICHOLS and HULL
HUMPHREYS, W. J. A Further Study of the Effect of Pressure on the Wave-Lengths of Lines in the Arc-Spectra of Certain Elements 4, 249
Changes in the Wave-Frequencies of the Lines of Emission Spectra of Elements, Their Dependence upon the Elements Themselves and upon the Physical Conditions under Which They Are Produced 6, 169
Effect of Pressure on Wave-Length 6, 428
Spectroscopic Results Obtained during the Solar Eclipse of May 18, 1901 . . . . . 15, 313
Note on Reflectors for Eclipse Work 16, 341
On Double Reversal 18, 204

VOLUME AND PAGE

HUMPHREYS, W. J. (*Continued*)
On Certain Methods of Economizing the Light in Spectrum Analyses 18, 324
On the Presence of Yttrium and Ytterbium in Fluor-Spar . 20, 266
A Few Additional Fluor-Spars Containing Yttrium and Ytterbium 22, 157
The Effect of a Pressure of Thirty-Seven Atmospheres on Certain Lines of the Arc Spectrum of Iron 22, 217
Reversal of Bands 22, 220
An Attempt to Find the Cause of the Width and of the Pressure-Shift of Spectrum Lines 23, 233
HUMPHREYS, W. J., and J. S. AMES. See AMES and HUMPHREYS
HUMPHREYS, W. J., and J. F. MOHLER. Effect of Pressure on the Wave-Lengths of Lines in the Arc-Spectra of Certain Elements 3, 114
HUMPHREYS, W. J., L. E. JEWELL, and J. F. MOHLER. See JEWELL, MOHLER, and HUMPHREYS
HUSSEY, WILLIAM J. Parallax of the Binary System *δ Equulei* . 17, 378
HUTCHINS, C. C. New Heads to Cyanogen Bands 15, 310
ICHINOHE, NAOZO. Orbit of the Spectroscopic Binary *κ Cancri* (See also Errata, **26**, 382.) 25, 315
JACOBY, HAROLD. Review of: *Handbuch der Geographischen Ortsbestimmung für Geographen und Forschungsreisende*, Adolf Marcuse 23, 178
JAEGERMANN, R. The Motion of the Matter Composing the Tail of the Comet 1903 IV, Observed July 24, 1903 . . . . 21, 323
JAMES, G. O. Review of: *Verification of the Ketteler-Helmholtz Dispersion Formulae by Optical Constants of Solid Dyes*, A. Pflüger; *Verification of Cauchy's Formulae for Metallic Reflection by Optical Constants of Solid Cyanin*, A. Pflüger; *The Anomalous Dispersion of Cyanin*, R. W. Wood . . 9, 187
JAUMANN, G. A Contribution to the Theory of Radiation . . 2, 215
JEANS, J. H. On the Density of *Algol* Variables 22, 93
JEWELL, LEWIS E. The Spectrum of *Mars* 1, 311; 3, 255
The Coincidence of Solar and Metallic Lines. A Study of the Appearance of Lines in the Spectra of the Electric Arc and the Sun 3, 89
The Determination of the Relative Quantities of Aqueous Vapor in the Atmosphere by Means of the Absorption Lines of the Spectrum. (See also Errata 5, 218.) 4, 324
Oxygen in the Sun 5, 99; 6, 456
Dr. Arendt's Spectroscopic Investigation of the Variation of Aqueous Vapor in the Atmosphere 5, 279

	VOLUME AND PAGE
JEWELL, LEWIS E. (*Continued*)	
The Structure of the Shading of the H and K and Some Other Lines in the Spectrum of the Sun and Arc	8, 51
A Chromospheric Line near K	8, 119
The Wave-Length of $H\delta$ and the Appearance of the Solar Spectrum near the Hydrogen Lines	9, 211
Notes on the Papers of Hartley and Ramage, Concerning the Spectrum of Gallium and the Spectra of Meteorites	9, 229
Spectroscopic Notes	11, 234
Photographic Notes	11, 240
The Use of the Lines of Titanium for Comparison Spectra and Their Prominence in the Chromosphere	11, 243
The Revision of Rowland's System of Standard Wave-Lengths	21, 23
JEWELL, L. E., and J. F. MOHLER. See also MOHLER and JEWELL	
JEWELL, L. E., J. F. MOHLER, and W. J. HUMPHREYS. Note on the Pressure of the "Reversing Layer" of the Solar Atmosphere	3, 138
JORDAN, F. C., and J. A. PARKHURST. See PARKHURST and JORDAN	
JULIUS, W. H. Solar Phenomena, Considered in Connection with Anomalous Dispersion of Light	12, 185
On the Origin of Double Lines in the Spectrum of the Chromosphere Due to Anomalous Dispersion of the Light from the Photosphere	15, 28
On Focusing Prismatic and Grating Cameras in Eclipse Work	16, 181
Peculiarities and Changes of Fraunhofer Lines Interpreted as Consequences of Anomalous Dispersion of Sunlight in the Corona	18, 50
Dispersion Bands in Absorption Spectra	21, 271
Spectroheliographic Results Explained by Anomalous Dispersion	21, 278
Dispersion Bands in the Spectra of δ *Orionis* and *Nova Persei*	21, 286
A New Method for Determining the Rate of Decrease of the Radiating Power from the Center toward the Limb of the Solar Disk	23, 312
Arbitrary Distribution of Light in Dispersion Bands, and Its Bearing on Spectroscopy and Astrophysics	25, 95
JUNGBLUTH, FRANZ. Regularities in the Structure of the Third Cyanogen Band	20, 237
KAYSER, H. Note on the Arc-Spectrum of Copper	1, 84
On the Spectra of Argon	4, 1
On the Mode of Printing Tables of Wave-Lengths	4, 306
On the Spectrum of ζ *Puppis*	5, 95
On the Spectrum of Hydrogen	5, 243
On the Arc-Spectra of the Elements of the Platinum Group	7, 93, 173
A Correction	8, 263

VOLUME AND PAGE

KAYSER, H. (*Continued*)
Standard Lines in the Arc Spectrum of Iron 13, 329
Spectral Phenomena Connected with the Cooling of Very Hot Stars 14, 313
On Standards of Wave-Lengths 19, 157
New Standards of Wave-Length 20, 327
KEELER, JAMES E. On a Lens for Adapting a Visually Corrected Refracting Telescope to Photographic Observations with the Spectroscope 1, 101
Schmidt's Theory of the Sun 1, 178
The Design of Astronomical Telescopes 1, 248
The Variable Star 3416 *S Velorum* 1, 262
Photographic Correcting Lens for Visual Telescopes . . 1, 350
The Displacement of Spectral Lines Caused by the Rotation of a Planet 1, 352
Dr. Pulfrich's Modification of the Littrow Spectroscope . . 1, 353
A Spectroscopic Proof of the Meteoric Constitution of Saturn's Rings 1, 416; 2, 163
Conditions Affecting the Form of Lines in the Spectrum of Saturn 2, 63
Recent Researches Bearing on the Determination of Wave-Lengths in the Infra-Red Spectrum 3, 63
Test of the Forty-Inch Objective of the Yerkes Observatory 3, 154
The Detection of the Lines of Water Vapor in the Spectrum of a Planet 4, 137
Photographic Studies of the Moon at the Paris Observatory . 5, 51
Spectrographic Observations of *Mars* in 1896–7 . . . . 5, 328
On the Mode of Printing Maps of Spectra and Tables of Wave-Lengths 6, 144
The Importance of Astrophysical Research and the Relation of Astrophysics to Other Physical Sciences 6, 271
Spectra of Stars of Secchi's Third Type 6, 423
The Hydrogen Atmosphere Surrounding the Wolf-Rayet Star $DM+30^{\circ}$ 3639 . . . . . 8, 113
Photographs of Comet I[X], 1898 (Brooks), Made with the Crossley Reflector of the Lick Observatory 8, 287
On Some Photographs of the Great Nebula in *Orion*, Taken by Means of the Less Refrangible Rays of Its Spectrum . . 9, 133
Note on the New Form of Photographic Telescope Proposed by Professor Pickering in H. C. O. Circular No. 39 . . 9, 269
Note on Photometric Researches by Photographic Methods, on the Nebula in *Orion* 10, 167

VOLUME AND PAGE

KEELER, JAMES E. (*Continued*)
The Ring Nebula in *Lyra* 10, 193
The Annular Nebula *H. IV 13* in *Cygnus* 10, 266
The Spiral Nebula *H. I 55 Pegasi* 11, 1
The Crossley Reflector of the Lick Observatory. (See also Correction, 16, 121.) 11, 325
Review of: *The Source and Mode of Solar Energy Throughout the Universe*, I. W. Heysinger 1, 268
Review of: *Ein neues Spectralphotometer*, Arthur König . . 2, 81
Review of: *Beobachtungen angestellt am Astrophysikalischen Observatorium in O Gyalla* 2, 81
Review of: *Untersuchung der spectralen Zusammensetzung verschiedener Lichtquellen*, Else Köttgen 2, 82
Review of: *Bemerkung zu der Abhandlung über Lichtemission*, G. Jaumann 2, 241
Review of: *Recherches spectrales sur l'étoile Altaïr. Reconnaissance d'un mouvement orbital et d'une atmosphère*, H. Deslandres 3, 78
Review of: *Spectrographische Untersuchungen des Saturnringes*, A. Belopolsky 3, 79
Review of: *On the Photographic Spectrum of the Great Nebula in Orion*, J. Norman Lockyer 3, 229
Review of: *Proposed Methods of Applying the Object-Glass Prism to the Measurement of Stellar Motions*, H. Deslandres and E. W. Maunder 3, 311
Review of: *La Spectroscopie*, Julien Lefèvre; *La Spectrométrie*, Julien Lefèvre; *Die Spectralanalyse*, John Landauer . . 4, 156
Review of: *Atlas of the Moon*, Lick Observatory . . . 5, 150
KELVIN, LORD. Application of Sellmeier's Dynamical Theory to the Dark Lines D_1, D_2 Produced by Sodium Vapor . . 9, 231
KEMPF, P. The Spectroheliograph of the Potsdam Observatory . 21, 49
KEMPF, P., and G. MÜLLER. See MÜLLER and KEMPF
KENT, NORTON A. Notes on the Zeeman Effect 13, 289
On the Effect of Circuit Conditions upon the Wave-Lengths of Spark Lines 17, 286
Review of: *The Theory of Optics*, Paul Drude 18, 75
Variability of Wave-Length in the Lines of Spark Spectra . . 22, 182
KENT, NORTON A., and GEORGE E. HALE. See HALE and KENT
KING, A. S. Some New Peculiarities in the Structure of the Cyanogen Bands 14, 323
Note on Some Effects of Ruling Errors in Grating Spectra . 17, 239
Some Effects of Change of Atmosphere on Arc Spectra with Reference to Series Relations 18, 129

VOLUME AND PAGE

KING, A. S. (*Continued*)
A Study of the Causes of Variability of Spark Spectra . . 19, 225
A Detailed Study of the Line Spectrum of Copper . . . 20, 21
Some Emission Spectra of Metals as Given by an Electric Oven 21, 236
Note on the Conditions Attending the Appearance of the Argon Lines in Air 21, 344
KING, A. S., and PERCIVAL LEWIS. See LEWIS and KING
KÖVESLIGETHY, R. DE. The Physical Meaning of the Star-Magnitude 11, 350
KONEN, H. A Contribution to the Knowledge of Spectroscopic Methods 17, 81
KONEN, H., and A. HAGENBACH. On Double Reversal . . . 19, 111
KOSTERSITZ, KARL. On a New Objective Method for the Measurement of Spectrograms 16, 262
KRUEGER, FRIEDRICH. Spectroscopic Observations of Colored Stars 2, 148
KURLBAUM, F., and H. RUBENS. See RUBENS and KURLBAUM
LAIRD, ELIZABETH R. The Absorption Spectrum of Chlorine 14, 85, 215, 216
LANGLEY, S. P. The Heat Radiation of the Corona . . . 12, 370
The Solar Constant and Related Problems 17, 89
On a Possible Variation of the Solar Radiation and Its Probable Effect on Terrestrial Temperatures 19, 305
On the Comparative Luminosity and Total Radiation of the Solar Corona 21, 194
LARMOR, J. Letter Regarding Proceedings of the Royal Society . 24, 55
LAVES, KURT. Researches on Planet 344, *Chicago* . . . 6, 450
Review of: *Astrometrie; oder, Die Lehre von der Ortsbestimmung im Himmelsraume*, Wilhelm Foerster 22, 283
Review of: *Cours d'Astronomie. Première partie: Astronomie théorique*, H. Andoyer 25, 288
LEBEDEW, PETER. Experimental Investigation of the Pressure of Light 15, 60
The Physical Causes of the Deviations from Newton's Law of Gravitation 16, 155
LESTER, O. C. On the Oxygen Absorption Bands of the Solar Spectrum 20, 81
LEWIS, PERCIVAL. The Measurement of Some Standard Wave-Lengths in the Infra-Red Spectra of the Elements . . 2, 1, 106
The Effect of Certain Impurities on the Spectra of Some Gases . 10, 137; 12, 16
Some New Fluorescence and Afterglow Phenomena in Vacuum Tubes Containing Nitrogen 12, 8
The Effects of Sodium on the Hydrocarbon Bands in the Spectrum of the Bunsen Flame 15, 122
Bands in the Bunsen Flame Spectrum of Sodium . . . 15, 296

VOLUME AND PAGE

LEWIS, PERCIVAL (*Continued*)
The Spectra of Cathodo-Luminescent Metallic Vapors . . 16, 31
Cathodo-Luminescence and the Negative-Pole Spectrum of Nitrogen 17, 258
The Afterglow of Metallic Vapors in Nitrogen—A New Band Spectrum 20, 49
Notes on the Spectra of Nitrogen and Its Oxides . . . 20, 58
A Large Quartz Spectrograph 23, 390
LEWIS, PERCIVAL, and A. S. KING. Nitrogen Bands vs. "New Heads to Cyanogen Bands" in Arc Spectra . . . 16, 162
LOCKYER, J. NORMAN. On the New Gases Obtained from Uraninite . 3, 29
The Total Eclipse of the Sun, April 16, 1896; Report and Discussion of the Observations Relating to Solar Physics . . 4, 81
On the Spark Discharge from Metallic Poles in Water . . 15, 190
LOHSE, O. Investigation of the Violet Part of Some Metallic Spectra Which Contain Many Lines 6, 95
LOMB, HENRY C. On the Theory of Cemented Doublets . . 24, 263
LORD, H. C. The Spectroscope of the Emerson McMillin Observatory 4, 50
Notes on the Determination of the Focus of an Objective . . 5, 305
Curvature of the Spectral Lines 5, 348
The New Photographic Correcting Lens of the Emerson McMillin Observatory 6, 87
The Stellar Spectrographic Work of the Emerson McMillin Observatory 6, 424
Some Observations on Stellar Motions in the Line of Sight Made at the Emerson McMillin Observatory 8, 65
On a Graphic Method of Comparing the Relative Efficiencies of Different Spectroscopes 9, 191
Observations of the Solar Eclipse of May 28, 1900 . . . 13, 149
On a Possible Variable Radial Velocity of Long Period . . 19, 246
Observations of the Radial Velocities of Thirty-One Stars Made at the Emerson McMillin Observatory 21, 297
LORENTZ, H. A. Considerations Concerning the Influence of a Magnetic Field on the Radiation of Light . . . 9, 37
LOVING, R. E. The Arc in High Vacua 22, 285
LOWATER, FRANCES. The Spectra of Sulphur Dioxide . . . 23, 324
LOWELL, PERCIVAL. On Martian Longitudes 1, 393
On the Existence of a Twilight Arc upon the Planet *Mars* . 2, 136
LUCAS, J. D., and TH. WULF. See WULF and LUCAS
LUDENDORFF, H. Orbit of the Spectroscopic Binary β *Arietis*. (See also Errata, **26**, 382.) 25, 320

VOLUME AND PAGE

LUNT, JOSEPH. On the Origin of Certain Unknown Lines in the Spectra of Stars of the β *Crucis* Type, and on the Spectrum of Silicon 11, 262
On the Spectrum of Silicon; with a Note on the Spectrum of Fluorine 22, 256
LUYTIES, OTTO. A Phenomenon Involved in the Nebulosity around *Nova Persei* 19, 129
LYMAN, THEODORE. On the Prolongation of Spectral Lines . 16, 328
Preliminary Measurement of the Short Wave-Lengths Discovered by Schumann 19, 263
The Spectrum of Hydrogen in the Region of Extremely Short Wave-Lengths 23, 181
The Absorption of Some Solids for Light of Extremely Short Wave-Lengths 25, 45
LYNN, W. T. The Color of *Sirius* in Ancient Times . . . 1, 351
MACHE, HEINRICH, and EDUARD HASCHEK. See HASCHEK and MACHE
MADDRILL, JAMES D. Calibration of a Wedge Photometer . . 22, 138
MAGIE, W. F. DeWitt Bristol Brace 22, 343
MASCARI, A. Résumé of Solar Observations Made at the Astrophysical Observatory of Catania in 1894–1896 . 2, 119; 4, 205; 6, 371
MAUNDER, E. WALTER. The Solar Origin of Terrestrial Magnetic Disturbances 21, 101
MAURY, ANTONIA C. The K Lines of β *Aurigae* 8, 173
MCCLEAN, FRANK. Comparison of Oxygen with the Extra Lines in the Spectra of the Helium Stars, β *Crucis*, etc.; also Summary of the Spectra of Southern Stars to the 3½ Magnitude and Their Distribution 7, 367
MCDERMOTT, F. P., JR. Observations on ζ *Geminorum* . . . 16, 118
MENDENHALL, C. E. Review of: *Ueber Gesetzmässigkeiten in den Spectren fester Körper* (Second Part), F. Paschen . . 7, 215
Review of: (1) *Anomalous Dispersion Curves of Some Solid Dyes*, A. Pflüger; (2) *On the Indices of Refraction of Solid Fuchsin*, B. Walter; (3) *On the Anomalous Dispersion of Absorbing Substances*, A. Pflüger; (4) *On the Indices of Refraction of Metals at Different Temperatures*, A. Pflüger . . . 5, 67
Review of: *On a New Photographic Method of Photometry and Its Use in the Ultra-Violet*, H. Th. Simon 5, 69
MENDENHALL, C. E., and F. A. SAUNDERS. The Radiation of a Black Body 13, 25
METCALF, JOEL H. A New Method for the Discovery of Asteroids 23, 306
A Photographic Method for the Detection of Variability in Asteroids 25, 264

VOLUME AND PAGE

MICHELSON, A. A. On the Conditions Which Affect the Spectro-Photography of the Sun 1, 1
On the Limit of Visibility of Fine Lines in a Telescope . . 2, 60
On the Broadening of Spectral Lines 2, 251
Radiation in a Magnetic Field 6, 48; 7, 131
The Echelon Spectroscope 8, 37
On the Spectra of Imperfect Gratings 18, 278
MICHELSON, W. On Doppler's Principle 13, 192
MIDDLEKAUFF, GEORGE W. The Effect of Capacity and Self-Induction upon Wave-Length in the Spark Spectrum . 21, 116
Review of: *The Cause of the Structure of Spectra*, William Sutherland 15, 350
MILLER, JOHN A. Solar Eclipse of August 30, 1905 . . . 23, 93
MILLOCHAU, G., and M. STEFÁNIK. On a New Form of Spectro-heliograph 24, 42
MITCHELL, S. A. Notes on the Concave Grating. (See also Correction, 8, 263.) 8, 102
The Direct Concave Grating Spectroscope 10, 29
Focal Singularities of Plane Gratings 14, 331
The Flash Spectrum, May 18, 1901 . . . . . 15, 97
The New Gases Neon, Argon, Krypton, and Xenon in the Chromosphere 17, 224
Comet 1903 Borrelly and Light-Pressure 20, 63
MITCHELL, S. ALFRED, and CHARLES LANE POOR. See POOR and MITCHELL
MITCHELL, WALTER M. Reversals in the Spectra of Sun-Spots . 19, 357
Researches in the Sun-Spot Spectrum, Region F to a . . 22, 4
The Relation between the Spectra of Sun-Spots and Fourth-Type Stars 23, 211
Results of Solar Observations at Princeton, 1905–1906 . . 24, 78
MIXTER, GEORGE W. Electro-Magnetic Waves 5, 354
MOHLER, JOHN FRED. The Effect of Pressure on Wave-Length. (See also Errata, 4, 374.) 4, 175
Pressure in the Electric Spark 10, 202
Persistence of the Corona after Totality 12, 102
The Doppler Effect and Reversal in Spark Spectra . . . 15, 125
MOHLER, J. F., and F. C. DANIEL. The Reversing Layer Photographed with a Concave Rowland Grating . . . 12, 361
MOHLER, J. F., and L. E. JEWELL. On the Wave-Length of Some of the Helium Lines in the Vacuum Tube and of D_3 in the Sun 3, 351
MOHLER, J. F., and W. J. HUMPHREYS. See HUMPHREYS and MOHLER
MOHLER, J. F., L. E. JEWELL, and W. J. HUMPHREYS. See JEWELL, MOHLER, and HUMPHREYS

VOLUME AND PAGE

MONCK, W. H. S. The Spectra and Proper Motions of Stars . . 8, 28
MOORE, J. H. The Loss of Light by Diffraction at a Narrow Slit 20, 285
Note on the Loss of Light in the 36-Inch Lick Objective . . 20, 292
The Spectrum of *Nova Aquilae* No. 2. . . . . 23, 261
A List of Four Stars Whose Radial Velocities Are Variable . 23, 263
MOORE, J. H., and W. W. CAMPBELL. See CAMPBELL and MOORE
MOORE, J. H., and R. W. WOOD. See WOOD and MOORE
MORSE, HARRY W. Spectra of Weak Luminescences . . . 21, 83, 410
Spectra from the Wehnelt Interrupter . . . 19, 162; 21, 223
MOULTON, F. R. Theory of the Determination of the Elements of a Parabolic Orbit from Two Observations of Apparent Position, and One of the Motion in the Line of Sight . . 10, 14
An Attempt to Test the Nebular Hypothesis by an Appeal to the Laws of Dynamics 11, 103
On the Evolution of the Solar System 22, 165
An Apology and an Explanation 22, 355
MÜLLER, G. A Proposal for the Photometric Observation of the Planet *Mercury* during the Total Solar Eclipse of May 28, 1900 . . . . . 11, 144
MÜLLER, G., and P. KEMPF. Remarks on Professor E. C. Pickering's Article, "Comparison of Photometric Magnitudes of the Stars" in *A. N.*, 3269 . . . . . 1, 428
A New Variable Star of Unusually Short Period . . . 17, 201
MÜLLER, OUDEMANS, DUNÉR, and HARTWIG. See under DUNÉR
MURPHY, D. W. Spectral Photometric Studies 6, 1
A Method of Determining the Luminosity Curve of the Solar Spectrum 11, 220
MYERS, G. W. The System of β *Lyrae* 7, 1
The Variable Star *U Pegasi* 8, 163
The November Meteors at Urbana, Illinois 9, 23
NAEGAMVALA, K. D. Photograph of "Flash" Spectrum at the Eclipse, January 21, 1898. (See also Correction, 8, 198.) . 8, 120
Ultra-Violet Coronal Lines 13, 240
NEWALL, H. F. Note on the Spectrum of Argon 1, 372
Description of a Spectroscope (The Bruce Spectroscope) Recently Constructed for Use in Connection with the 25-Inch Refractor of the Cambridge Observatory 3, 266
NEWCOMB, SIMON. Aspects of American Astronomy . . . 6, 289
The Solar Motion as a Gauge of Stellar Distances . . . 6, 441
On the Period of the Solar Spots 13, 1
A Rude Attempt to Determine the Total Light of All the Stars 14, 297
An Observation of the Zodiacal Light to the North of the Sun . 22, 209
Note on Zodiacal Light Observations 23, 169

VOLUME AND PAGE

NICHOLS, E. F. On the Heat Radiation of *Arcturus*, *Vega*, *Jupiter*, and *Saturn* 13, 101
Review of: *Harper's Scientific Memoirs*, Edited by Joseph S. Ames. No. 1, *The Free Expansion of Gases;* No. 2, *Prismatic and Diffraction Spectra* 9, 277
Review of: *An Introduction to the Theory of Optics*, Arthur Schuster 21, 382
NICHOLS, E. F., and G. F. HULL. Pressure Due to Light and Heat Radiation 15, 62
The Pressure Due to Radiation 17, 315
The Application of Radiation Pressure to Cometary Theory . 17, 352
NIPPOLDT, A. On the Investigation of Simultaneous Occurrences in the Solar Activity and Terrestrial Magnetism . . 20, 202
NUTTING, P. G. On a Balancing Rheostat for Bolometers . . 11, 44
The Complete Emission Function 12, 208
The Spectra of Mixed Gases 19, 105
Secondary Spectra 19, 239
On the Transition from Primary to Secondary Spectra . . 20, 131
High-Temperature Radiation. 21, 400
The Spectra of Alloys 22, 131
Line Structure 23, 64, 220; 24, 111
OPPOLZER, EGON VON, On Brester's Views as to the Tranquillity of the Solar Atmosphere 1, 260
Photographic Extinction 9, 317
On the Number of Stars upon a Photographic Plate . . 16, 332
Remarks on Bigelow's "Eclipse Meteorology" 16, 334
OUDEMANS, HARTWIG, MÜLLER, and DUNÉR. See under DUNÉR
PALMER, HAROLD KING. The Distribution of Stars in the Cluster *Messier 13*, in *Hercules* 10, 246
An Application of the Crossley Reflector of the Lick Observatory to the Study of Very Faint Spectra 18, 218
A Short Method of Computing Approximate Value of the Reduction to Sun in Radial Velocity Determinations . . . 24, 51
PARKHURST, J. A. Determination of the Wedge Constant of a Stellar Photometer 13, 249
Notes on Variable Stars 14, 169
The Variable Star *X Cephei*. (See also Errata, 17, 163.) . 17, 48
Nova Geminorum. An Early Photograph and Photometric Magnitudes 17, 373
The Variable Star 6871 *V Lyrae* 18, 33
The Variable Star 1921 *W Aurigae* 18, 309
Faint Stars near the Trapezium in the *Orion* Nebula . . 20, 136
Nova Aquilae of 1905 . . . . . 22, 266

VOLUME AND PAGE

PARKHURST, J. A. (*Continued*)
Review of: *Photometrische Durchmusterung des nördlichen Himmels, enthaltend alle Sterne der B. D. bis zur Grösse 7.5*, G. Müller und P. Kempf 10, 59
Review of: *Photometric Revision of the Harvard Photometry during the Years 1891–1894*, Edward C. Pickering . . 12, 236
Review of: *Observations of Variable Stars by Argelander, Schönfeld, and Schmidt. Annals of the Astronomical Observatory of Harvard College*, Vol. XXXIII 12, 305
Review of: *Observations of Variable Stars Made at the Rousdon Observatory* 20, 364
Review of: *Popular Star Maps: A Rapid and Easy Method of Finding the Principal Stars*, Comte de Miremont . . 22, 163
Review of: *Atlas Stellarum Variabilium*, Series V, J. G. Hagen 24, 59
Review of: *Generalkatalog der Potsdamer photometrischen Durchmusterung des nördlichen Himmels*, G. Müller und P. Kempf 25, 286
Review of: *Atlas Stellarum Variabilium*, Series IV, J. G. Hagen 25, 361
PARKHURST, J. A., and ZACCHEUS DANIEL. The Variable Star 7792 *SS Cygni* 12, 259
PARKHURST, J. A., and F. C. JORDAN. Photographic Photometry of Short-Period Variable Stars 23, 79
PARSONS, LOUIS A. The Spectrum of Hydrogen 18, 112
PASCHEN, F. On the Existence of Law in the Spectra of Solid Bodies, and on a New Determination of the Temperature of the Sun. (See also Errata on loose insert issued with Vol. 3, No. 1.) 2, 202
On Mr. Very's Remarks Concerning My Note on Laws of Radiation 3, 150
On the Distribution of the Energy in the Spectrum of the Black Body at Low Temperatures 10, 40
On the Distribution of Energy in the Spectrum of the Black Body at High Temperatures 11, 288
PASCHEN, F., and C. RUNGE. See RUNGE and PASCHEN
PASCHEN, F., and H. WANNER. A Photometric Method for the Determination of the Exponential Constant of the Emission Function 9, 300
PELLIN, PH., and ANDRÉ BROCA. A Spectroscope of Fixed Deviation 10, 337
PEROT, A., and CHARLES FABRY. On the Application of Interference Phenomena to the Solution of Various Problems of Spectroscopy and Metrology 9, 87
A Reply to the Recent Article by Louis Bell 16, 36
Rapport sur la nécessité d'établir un nouveau système de longueurs d'onde étalons 20, 318
See also FABRY and PEROT

VOLUME AND PAGE

PERRINE, C. D. Preliminary Report of Observations of the Total Solar Eclipse of 1901, May 17, 18 . . . . . 14, 349
Motion in the Faint Nebula Surrounding *Nova Persei* . . 14, 359
Further Observations of the Movements and Changes in the Nebulosity about *Nova Persei* 15, 136
Origin of a Disturbed Region Observed in the Corona of 1901, May 17–18 . . . . . 15, 147
Photographs and Measures of the Nebula Surrounding *Nova Persei* 16, 249
Observations of the Nebulosity about *Nova Persei* for Polarization Effects 16, 257
The Spectrum of the Nebulosity Surrounding *Nova Persei* . 17, 310
Photographic Spectrum of *Nova Geminorum* 18, 297
Recent Spectrographic Observations of *Novae* with the Crossley Reflector 19, 80
International Co-operation in Solar Research 20, 301
Some Total Solar Eclipse Problems 20, 331
A Division of the Stars in Some of the Globular Star Clusters, According to Magnitude 20, 354
The Number of the Nebulae 20, 356
PETERS, G. H. Some Results of the Total Eclipse in Sumatra of May 18, 1901, Obtained with the Photoheliograph, at Fort de Kock 16, 92
PFUND, A. H. Polarization and Selective Reflection in the Infra-Red Spectrum 24, 19
Review of: *Resolution of Spectral Lines by Means of Interference Points Produced by Plane-parallel Plates*. E. Gehrcke and O. von Baeyer 24, 364
PICKERING, EDWARD C. Discovery of Variable Stars from Their Photographic Spectra 1, 27
T Andromedae 1, 305
Variable Star Clusters 2, 321; 6, 258; 7, 208
New Variable Stars 3, 296; 4, 138, 234, 369; 7, 208; 13, 226; 23, 257
Light Curves of Variable Stars Determined Photometrically . 3, 281
The *Algol* Variable + 17° 4367 *W Delphini* 3, 77, 163, 200, 213; 4, 320; 7, 23
Variable Star Work of the Harvard Observatory . . . 6, 418
The Variable Star *U Pegasi* 7, 141
Comparison Stars for Variables 7, 308
Variable Stars of Short Period 8, 55
The Supposed Variable *Y Aquilae* 8, 57
Variable Stars in Clusters 8, 257
The Variable Stars *U Vulpeculae* and *ST Cygni*. *S Antliae* . 9, 179
The New *Algol* Variable, *SW Cygni*, 45° 3062 . . . 10, 126

	VOLUME AND PAGE
PICKERING, EDWARD C. (*Continued*)	
Mme. Ceraski's Second *Algol* Variable *SY Cygni*	11, 165
Variable Stars in Clusters. Rate of Increase of Light	12, 159
Co-operation in Observing Variable Stars	13, 167
Early Observations of *Algol* Stars	15, 229
A New *Algol* Variable, +43° 4101, *UZ Cygni*	15, 343
Williams' New *Algol* Variable, 13. 1902, *RV Lyrae*	16, 336
Variability of *Iris* (7)	19, 220
Variable Stars in the Nebula of *Orion*	19, 289
A New *Algol* Variable, −15° 4905, *V Serpentis*	20, 296
A New Variable, *SV Herculis*	20, 357
A New Star in *Aquila*	12, 52
Nova Aquilae No. 2. 185604	22, 271
A New Star in *Carina*	2, 320
A New Star in *Centaurus*	3, 162, 214
Anderson's New Star in *Perseus*	13, 170
Nova Persei No. 2	13, 232; 14, 82
Spectrum of *Nova Persei* No. 2	14, 79
Early Observations of *Nova Persei* No. 2	16, 338
New Nebulae and Nebulous Stars	9, 173
Nova Geminorum before Its Discovery	17, 305
A Probable New Star, *RS Ophiuchi*	22, 90
A New Star in *Sagittarius*	9, 182, 269; 10, 285
The Spectrum of *ζ Puppis*	5, 92; 6, 258; 13, 230
Stars Resembling *ζ Puppis*	8, 119
Spectrum of a Meteor	6, 461
Spectra of Bright Southern Stars	6, 349
A New Spectroscopic Binary *β Lupi*	7, 139
A New Spectroscopic Binary *μ¹ Scorpii*	4, 235
A New Spectroscopic Binary *V Puppis*	4, 373
A Variable Bright Hydrogen Line	7, 139
Photographic Spectrum of the Aurora	7, 392
Spectrum of *η Carinae*	14, 82
Objects Having Peculiar Spectra	14, 144
Spectrum of Lightning	14, 367
Stars Having Peculiar Spectra	4, 142, 369; 5, 350; 8, 116; 14, 144; 19, 287; 21, 292; 22, 87; 23, 257
Spectra of Known Variables	22, 90; 23, 260
Determination of Radial Motions by Objective Prisms	23, 255
Witt's Planet (433) *D Q* [*Eros*]	8, 261; 9, 53, 116
Opposition of *Eros* in 1900	11, 244
Positions of *Eros* (433) in 1893, 1894, and 1896	12, 55
Variability in Light of *Eros*	13, 273

VOLUME AND PAGE

PICKERING, EDWARD C. (*Continued*)
Variation in Light of *Eros* 13, 277
Opposition of *Eros* (433) in 1903 . . . . . 14, 209
Miscellaneous Results, No. 1 . . . . . 16, 336
Comparison of Photometric Magnitudes of the Stars . . 1, 154
Eclipse of *Jupiter's* Fourth Satellite, February 19, 1895 . . 1, 309
A New Form of Stellar Photometer 2, 89
Eye-Estimates of Stellar Magnitude 4, 305
Relative Motion of the Stars in the Line of Sight . . . 4, 370
Distribution of Stars in Clusters 5, 352
Southern Double Stars 6, 258
Large Magellanic Cloud 6, 459
Photographic Magnitudes 7, 139
Polarizing Photometers 7, 211
Occultation of *26 Arietis* Observed Photographically . . 7, 306
The November Meteors in 1898 . . . . . 8, 115; 9, 51
The Nebula in *Andromeda* 8, 262
A New Satellite of *Saturn* 9, 173, 274
The Ninth Satellite of *Saturn* 20, 357
A New Form of Photographic Telescope 9, 175
The November Meteors of 1899 . . . . . 10, 221
Photographing Meteors 9, 178
A Long Photographic Telescope 10, 223
A Photographic Search for an Intermercurial Planet . . 11, 322
Measurement of Photographic Intensities 11, 416
Transparency of Comet 1902 *b* 17, 245
A Photographic Map of the Entire Sky 18, 70
PICKERING, EDWARD C., J. G. HAGEN, and M. B. SNYDER. The Northern Durchmusterung 7, 295
PICKERING, WILLIAM H. Observations of the Total Solar Eclipse of May 28, 1900, by the Harvard Observatory Expedition . 12, 94
Nova Persei 13, 277
The Explosion Hypothesis in the Light of the Recent Phenomena of *Nova Persei* 15, 68
Note on the Evolution of the Solar System 22, 354
Reply to Professor F. R. Moulton 22, 357
PLASKETT, J. S. The Character of the Star Image in Spectrographic Work 25, 195
PLUMMER, H. C. Note on the Concave Grating 16, 97
POOR, CHARLES LANE. A Possible Form of Mirror for Reflecting Telescopes 6, 440
The Aberration of Parabolic Mirrors 7, 114
The Figure of the Sun 22, 103, 305

	VOLUME AND PAGE
POOR, CHARLES LANE, and S. ALFRED MITCHELL. The Concave Grating for Stellar Photography	7, 157
PORTER, JAMES T. Selective Reflection in the Infra-Red Spectrum	22, 229
PORTER, ROYAL A. The Influence of Atmospheres of Nitrogen and Hydrogen on the Arc Spectra of Iron, Zinc, Magnesium, and Tin, Compared with the Influence of an Atmosphere of Ammonia	15, 274
PRECHT, J., and C. RUNGE. See RUNGE and PRECHT	
PRITCHETT, H. S. Personal Equation in Longitude Determinations	6, 438
PULFRICH, C. On a New Form of Spectroscope	1, 335
A New Form of Refractometer	3, 259
RAMAGE, HUGH. The Spectra of Potassium, Rubidium, and Caesium, and Their Mutual Relations	16, 43
RAMAGE, HUGH, and W. N. HARTLEY. See HARTLEY and RAMAGE	
RAMSAY, WILLIAM. Terrestrial Helium (?)	1, 439
REES, J. K. The Work of the Columbia University Observatory	6, 431
Examination of *Pleiades* and *Eros* Plates Taken with the Crossley Reflector of the Lick Observatory	13, 48
REESE, HERBERT M. An Investigation of the Zeeman Effect	12, 120
Diffraction by Light of Variable Intensity	13, 199
A Determination of the Orbit of *Capella*	14, 263
A Determination of the Cause of the Discrepancy between Measures of Spectrograms Made with Violet to Left and with Violet to Right	15, 142
Four Stars Whose Velocities in the Line of Sight Are Variable	17, 308
A Star with a Great Radial Velocity	17, 310
Review of: *Light Waves and Their Uses*, A. A. Michelson	19, 300
A Study of Enhanced Lines of Titanium, Iron, and Nickel	19, 322
On the Enhanced Series of Titanium, Iron, and Nickel	22, 222
A Mechanical Illustration of the Plane Grating	24, 47
An Occulting Shutter for Concave Grating Spectroscopes	24, 49
REESE, H. M., and H. D. CURTIS. The Spectrum of *Nova Geminorum*	18, 299
REESE, H. M., J. S. AMES, and R. F. EARHART. SEE AMES, EARHART, and REESE	
REESE, STANLEY C. Field of the Reflecting Telescope	12, 219
Review of: *Theorie und Geschichte des Photographischen Objectivs*, Moritz von Rohr	15, 70
Review of: *Die optischen Instrumente*, Moritz von Rohr	23, 176
REID, HARRY FIELDING. Preliminary Note on the Radiation of Incandescent Platinum	2, 160
RICCÒ, A. On Some Attempts to Photograph the Solar Corona without an Eclipse, Made at the Mount Etna Observatory	1, 18

VOLUME AND PAGE

RICCÒ, A. (*Continued*)
Photograph of the Nebula near *42 Orionis* Made at the Astrophysical Observatory of Catania 2, 164
Note on the Duplicity of the D_3 Line 2, 236
On the Level of Sun-Spots and the Cause of Their Darkness . 6, 91
The Work of the Catania Astrophysical Observatory . . 6, 453
Pietro Tacchini 22, 1
RIGGE, WILLIAM F. Review of: *Elementi di Astronomia ad uso del Scuole e per Istruzione privata*, P. Adolfo Müller . . 24, 307
RISTENPART, F. The Inferior Conjunction of *Mercury* on November 4, 1901 . . . . . 14, 213
RITCHEY, G. W. A Support System for Large Specula . . . 5, 143
Celestial Photography with the 40-Inch Visual Telescope of the Yerkes Observatory 12, 352
Nebulosity about *Nova Persei* 14, 167
The Two-Foot Reflecting Telescope of the Yerkes Observatory 14, 217
Changes in the Nebulosity about *Nova Persei* 14, 293
Later Photographs of the Nebula about *Nova Persei* . . 15, 129
Comet Photography with the Two-Foot Reflector . . . 16, 178
On Methods of Testing Optical Mirrors during Construction . 19, 53
RITTER, A. On the Constitution of Gaseous Celestial Bodies . . 8, 293
ROBERTS, ALEXANDER W. Close Binary Systems and Their Relation to Short-Period Variations 2, 283
Certain Considerations Concerning the Accuracy of Eye-Estimates of Magnitudes by the Method of Sequences . . 4, 184
Notes on a Method of Determining the Value of the Light Ratio 4, 265
Density of Close Double Stars 10, 308
On the Orbits of the *Algol* Variables *RR Puppis* and *V Puppis* 13, 177
ROBERTS, ISAAC. Herschel's Nebulous Regions 17, 72
ROGOVSKY, E. On the Temperature and Composition of the Atmospheres of the Planets and the Sun. (See also Errata, 15, 69.). 14, 234
ROWLAND, HENRY A. Preliminary Table of Solar Spectrum Wave-Lengths
λλ 2975.587–3259.567 . . . . . 4, 106, 278
3259.720–3721.779 . . . . . 5, 11, 109, 181
3722.071–4674.484 . . . . . 1, 29, 131, 222, 295, 377
4674.648–5913.930 . . . . . 2, 45, 109, 188, 306, 360
5914.118–7331.225 . . . . . 3, 141, 201, 356
Corrections and Additions 6, 384
Note on the Presence of Vanadium in Rutile 6, 157
ROWLAND, HENRY A., and CALEB N. HARRISON. Arc-Spectrum of Vanadium 7, 273
Arc-Spectra of Zirconium and Lanthanum 7, 373

VOLUME AND PAGE

ROWLAND, HENRY A., and R. R. TATNALL. The Arc-Spectra of the Elements
I. Boron and Beryllium 1, 14
II. Germanium 1, 149
III. Platinum and Osmium 2, 184
IV. Rhodium, Ruthenium, and Palladium 3, 286
RUBENS, H., and E. ASCHKINASS. Observations on the Absorption and Emission of Aqueous Vapor and Carbon Dioxide in the Infra-red Spectrum 8, 176
RUBENS, H., and F. KURLBAUM. On the Heat Radiation of Long Wave-Length Emitted by Black Bodies at Different Temperatures 14, 335
RUNGE, C. The Short Wave-Lengths of the Spark Spectrum of Aluminium 1, 433
Oxygen in the Sun 6, 426
On the Relative Intensities of the Lines in the Spectrum of the *Orion* Nebula 8, 32
On the Red End of the Red Argon Spectrum 9, 281
On the Spectra of Krypton 10, 73
On the Spectrum of Radium 12, 1
On the Spectrum of the Aurora 18, 381
RUNGE, C., and F. PASCHEN. On the Spectrum of Clèveite Gas. (See also Correction, 3, 161.) 3, 4
Oxygen in the Sun 4, 317
On the Series Spectra of Oxygen, Sulphur, and Selenium . . 8, 70
On the Compound Triplets in the Line Spectrum of Mercury . 14, 49
On the Radiation of Mercury in the Magnetic Field 15, 235; 16, 118
On the Separation of Corresponding Series Lines in the Magnetic Field 15, 333; 16, 123
RUNGE, C., and J. PRECHT. On the Flame Spectrum of Radium 17, 147
The Position of Radium in the Periodic Series According to Its Spectrum 17, 232
RUSSELL, HENRY NORRIS. The Atmosphere of *Venus* . . . 9, 284
The Densities of the Variable Stars of the *Algol* Type . . 10, 315
An Improved Method of Calculating the Orbit of a Spectroscopic Binary 15, 252
On the Light-Variations of Asteroids and Satellites . . . 24, 1
RYDBERG, J. R. The New Elements of Clèveite Gas . . . 4, 91
The New Series in the Spectrum of Hydrogen 6, 233
On Triplets with Constant Differences in the Line Spectrum of Copper 6, 239
On the Constitution of the Red Spectrum of Argon . . . 6, 338

VOLUME AND PAGE

SAUNDERS, F. A. Note on a New Form of Radiometer . . . 14, 136
Some Additions to the Arc Spectra of the Alkali Metals . . 20, 188
Note on the Narrow Triplets in the Spectra of Calcium and Strontium 21, 195
SAUNDERS, F. A., and C. E. MENDENHALL. See MENDENHALL and SAUNDERS
SCHAEBERLE, J. M. Observations of the Spectrum of the *Orion* Nebula 6, 364
SCHEINER, J. On the Cause of the Granulation of the Surface of the Sun 2, 77
On the Spectrum of Hydrogen in the Nebulae 7, 231
Note on Professor Campbell's Observations of Variations in the Intensities of the Lines in the *Orion* Nebula 7, 295
On the Spectrum of the Great Nebula in *Andromeda* . . 9, 149
On Professor Keeler's Photometric Researches, by Photographic Methods, on the Nebula of *Orion* 10, 164
A Suggested Explanation of the Solar Corona 12, 25
Remarks on Professor Kayser's Article "Spectral Phenomena Connected with the Cooling of Very Hot Stars" . . 15, 342
SCHEINER, J., and J. WILSING. Determination of the Intensity-Ratios of the Principal Lines in the Spectra of Several Gaseous Nebulae 16, 234
SCHENCK, CHARLES C. Some Properties of the Electric Spark and Its Spectrum 14, 116
SCHLESINGER, FRANK. Reduction to the Sun of Observations for Motion in the Line of Sight. (See also Errata, 10, 299.) . 9, 159
Line of Sight Constants for the Principal Stars. (See also Errata, 10, 299.) 10, 1
Review of: *Die Photographie der Gestirne*, J. Scheiner . . 10, 132
Suggestions for the Determination of Stellar Parallax by Means of Photography 10, 242
Review of: *Cours élémentaire d'astronomie et de navigation*, P. Constan 19, 389
On the Stellar Parallax Plates Taken with the Yerkes Telescope 20, 123
Review of: *Guide du calculateur*, J. Boccardi 22, 161
SCHMIDT, G. C., and E. WIEDEMANN. See WIEDEMANN and SCHMIDT
SCHUMANN, VICTOR. New Method of Preparing Plates Sensitive to the Ultra-Violet Rays 3, 220, 387; 4, 144
A Second Spectrum of Hydrogen Beyond λ 185 $\mu\mu$ . . . 11, 312
SCHUSTER, ARTHUR. Note on the Results of Messrs. Jewell, Humphreys, and Mohler 3, 292
Oxygen in the Sun 5, 162
On the Mode of Printing Maps of Spectra and Tables of Wave-Lengths 6, 415

VOLUME AND PAGE

SCHUSTER, ARTHUR (*Continued*)
The Solar Atmosphere 16, 320
The Evolution of Solar Stars 17, 165
Radiation through a Foggy Atmosphere 21, 1
The Optics of the Spectroscope 21, 197
The Temperature of the Solar Atmosphere 21, 258
The Periodicity of Sun-Spots 23, 101
On the Velocity of Metallic Particles in the Spark Discharge . 25, 277
SCHWARZSCHILD, K. On the Deviations from the Law of Reciprocity for Bromide of Silver Gelatine 11, 89
On the Effect of Intermittent Exposure on Bromide of Silver Gelatine 11, 92
SCHWARZSCHILD, K., and W. VILLIGER. On the Distribution of Brightness of the Ultra-Violet Light on the Sun's Disk . 23, 284
Note on the Ultra-Violet Radiation of Sun-Spots and Faculae . 23, 345
SCOBLE, WALTER A., and LORD BLYTHSWOOD. See BLYTHSWOOD and SCOBLE
SEAGRAVE, F. E. Observations of the Eclipse of May 28, 1900, Made at Southern Pines, N. C. 12, 98
SEARES, F. H. Review of: *A Compendium of Spherical Astronomy with Its Application to the Determination and Reduction of Positions of the Fixed Stars*, Simon Newcomb 24, 305
SEE, T. J. J. Meeting of the Section of Mathematics, Astronomy, and Physics of the Chicago Academy of Sciences, December 11, 1894 . . . . . 1, 86
Loss of Library by Fire 6, 462
SEELIGER, H. A Remark on the Articles on the Density of the *Algol* Stars in the *Astrophysical Journal*, Vol. X, No. 5. (See also Errata, 14, 215.) 11, 247
Remarks on Mr. Easton's Article "On a New Theory of the Milky Way" in the *Astrophysical Journal*, Vol. XII, p. 136 12, 376
The Nebulae in the Vicinity of *Nova Persei*. (See also Errata, 17, 163.) 16, 187; 20, 105
SHAW, H., and A. FOWLER. See FOWLER and SHAW
SIDGREAVES, WALTER. *Nova Persei*, February 28 to April 4: Stonyhurst College Observatory 13, 278
The Spectrum of *Nova Persei* 14, 366
SLIPHER, V. M. The Lowell Spectrograph 20, 1
A List of Five Stars Having Variable Radial Velocities . . 20, 146
The Variable Radial Velocity of γ *Geminorum* 22, 84
Observations of Standard Velocity Stars with the Lowell Spectrograph (1905) 22, 318
Variable Radial Velocity of δ *Capricorni* 24, 361

VOLUME AND PAGE

SLIPHER, V. M. (*Continued*)
The Spectrum of *Mira Ceti* 25, 66, 235
Variable Radial Velocity of *U Cephei* 25, 284
The Spectrum of *ε Capricorni* 25, 285
SLOCUM, FREDERICK. Note on the Distortion Due to the Lens in a Projection Drawing 6, 259
Note on Sun Drawings 7, 90
SMITH, HARRISON W. Photographic Work of the Eclipse Expedition from the Massachusetts Institute of Technology . . 15, 199
SNYDER, C. P. The Wave-Number System of Rhodium. . . . 14, 179
SNYDER, M. B., E. C. PICKERING, and J. G. HAGEN. See PICKERING, HAGEN, and SNYDER
SOUTHALL, JAMES P. C. The Geometrical Theory of Optical Imagery 24, 156
SPENCE, B. J., and H. CREW. See CREW and SPENCE
STARK, J. On the Radiation of Canal Rays in Hydrogen . 25, 23, 170
Remarks on Hull's Observations of the Doppler Effect in Canal Rays 25, 230
STEBBINS, JOEL. Note on the Spectrum of *Nova Persei* . . 14, 292
The Spectrum of *o Ceti* 18, 341
STEBBINS, JOEL, and GEORGE C. COMSTOCK. See COMSTOCK and STEBBINS
STEFÁNIK, M., and G. MILLOCHAU. See MILLOCHAU and STEFÁNIK
STEWART, A. W., and E. C. C. BALY. The Chemical Reactivity of the Carbonyl Group as Measured by Its Absorption Spectrum 24, 95
See also BALY and STEWART
STEWART, DE LISLE. Objective-Prism Comparison Spectrograph . 23, 396
STILLHAMER, A. G. Review of: *Manual of Advanced Optics*, C. Riborg Mann 23, 175
STONEY, G. JOHNSTONE. Of Atmospheres upon Planets and Satellites. (See also Errata, 8, p. vii.) 7, 25
On the Presence of Helium in the Earth's Atmosphere and on Its Relation to the Kinetic Theory of Gas 8, 316
On the Escape of Gases from Planetary Atmospheres According to the Kinetic Theory 11, 251, 357
Note on Inquiries as to the Escape of Gases from Atmospheres . 12, 201
Escape of Gases from Atmospheres 20, 69
STONEY, G. JOHNSTONE, and A. M. W. DOWNING. Perturbations of the *Leonids* 9, 203
STRATTON, F. J. M. Planetary Inversion 24, 46
STRONG, W. W. On the Magnesium Spark 22, 119
TACCHINI, P. Résumé of Solar Observations Made at the Royal Observatory of the Roman College, 1894–1898
1, 210; 2, 224; 3, 252; 4, 182; 5, 159; 6, 244; 7, 170; 8, 223

VOLUME AND PAGE

TACCHINI, P. (*Continued*)
On the Distribution in Latitude of Solar Phenomena Observed at the Royal Observatory of the Roman College in 1894 . 2, 26
TATNALL, R. R., and H. A. ROWLAND. See ROWLAND and TATNALL
THIELE, T. N. Resolution into Series of the Third Band of the Carbon Band-Spectrum 8, 1
TODD, DAVID P. Automatic Photography of the Corona . . 5, 318
The Amherst Eclipse Expedition to Singkep, 1901 . . . 14, 362
TUCKER, R. H. Correspondence of the Photographic Durchmusterung with the Visual 7, 330
TUCKERMAN, L. B. Notes on Spectro-Photometric Adjustments . 16, 145
UPTON, WINSLOW. Observations of the Total Eclipse of May 28, 1900, at Centreville, Va. 12, 89
VALENTA, E., and J. M. EDER. See EDER and VALENTA
VAN ORSTRAND, C. E., and ARTHUR L. DAY. See DAY and ORSTRAND
VERY, FRANK W. Note on Earlier Observations of Atmospheric Absorption Bands in the Infra-Red Spectrum . . . 2, 237
Photometry of a Lunar Eclipse 2, 293
Note on Paschen's Laws of Radiation 2, 316
Further Considerations in Regard to Laws of Radiation . . 4, 38
On the Mode of Printing Maps of Spectra and Tables of Wave-Lengths 6, 55
Heliographic Positions. (See also Errata, 7, 214.) . 6, 246, 400; 7, 56
The Variation of Solar Radiation 7, 255
The Probable Range of Temperature on the Moon . . 8, 199, 265
Note on the Position of the Maximum in the Spectral Energy-Curve of a Black Body 10, 208
Observations of the Eclipse of May 28, 1900, at Norfolk, Va. . 12, 100
The Absorptive Power of the Solar Atmosphere . . . 16, 73
The Absorption of Radiation by the Solar Atmosphere and the Intrinsic Radiation of That Atmosphere 19, 139
Note on the Parallax of *Nova Persei* 20, 79
The Temperature of the Moon. (See also Errata, 26, 382.) . 24, 351
VILLIGER, W., and KARL EXNER. See EXNER and VILLIGER
VILLIGER, W., and K. SCHWARZSCHILD. See SCHWARZSCHILD and VILLIGER
VOGEL, H. C. Recent Researches on the Spectra of the Planets 1, 196, 273
Friedrich Wilhelm Gustav Spörer 2, 239
On the Occurrence in Stellar Spectra of the Lines of Clèveite Gas, and on the Classification of Stars of the First Spectral Type 2, 333
The Absorption of Light as a Determining Factor in the Selection of the Size of the Objective for the Great Refractor of the Potsdam Observatory 5, 75

VOLUME AND PAGE

VOGEL, H. C. (*Continued*)
Sources of Error in Investigation on the Motion of Stars in the Line of Sight 7, 249
On the Spectrum of α *Aquilae* and Its Velocity in the Line of Sight 9, 1
On the Progress Made in the Last Decade in the Determination of Stellar Motions in the Line of Sight 11, 373
Description of the Spectrographs for the Great Refractor at Potsdam 11, 393
On the Spectrum of *Nova Persei* 13, 217
On the Motion of α *Persei* in the Line of Sight 13, 320
The Spectroscopic Binary *Mizar* 13, 324
Radial Velocity of the *Orion* Nebula 15, 302
The Spectroscopic Binary ο *Persei* 17, 212
ε *Aurigae* a Spectroscopic Binary 17, 243
Researches on the System of the Spectroscopic Binary β *Aurigae* . 19, 360
On Reflecting Telescopes of Relatively Short Focus. (See also Errata, 24, 369.) 23, 370
WADSWORTH, F. L. O. The Design of Electric Motors for Constant Speed 1, 169
Notes on Silvering Solutions and Silvering 1, 252
The Modern Spectroscope:
X. General Considerations Respecting the Design of Astronomical Spectroscopes 1, 52
XI. Some New Designs of Combined Grating and Prismatic Spectroscopes of the Fixed-Arm Type, and a New Form of Objective Prism 1, 232
XIII. A New Multiple Transmission Prism of Great Resolving Power 2, 264
XIV. Fixed-Arm Concave Grating Spectroscopes . . . 2, 370
XV. On the Use and Mounting of the Concave Grating as an Analyzing or Direct Comparison Spectroscope 3, 47
XVI. Device for Isolating Any Portion of the Diffraction Spectrum, and Some Further Notes on Astronomical Spectroscopes 3, 169
XVIII. On the Conditions of Maximum Efficiency in the Use of the Modern Spectroscope. 3, 321
XX. On a New Form of Fluid Prism without Solid Walls, and Its Use in an Objective Spectroscope . . 4, 274
Note on the Preparation of Phosphorescent Barium Sulphide . 4, 308
Note on a Combined Equatorial Telescope and Polar Heliostat . 4, 310
On a New Form of Mounting for Reflecting Telescopes Devised by the Late Arthur Cowper Ranyard 5, 132

	VOLUME AND PAGE
WADSWORTH, F. L. O. (*Continued*)	
A Note on a New Form of Fluid Prism	5, 149
Thermal Measurements with the Bolometer by the Zero Method	5, 268
Tables of the Practical Resolving Power of Spectroscopes	6, 27
On the Conditions of Maximum Efficiency in Astrophotographic Work:	
Part I. General Theory of the Telescopic Images of Different Forms of Radiating Sources	6, 119
Part II. Effect of Atmospheric Aberration on the Intensity of Telescopic Images	7, 70
Adam Hilger	6, 139
A Note on the Effect of Heat on Phosphorescence	6, 153
A Note on the Theory of Telescopic Images	6, 463
A Note on the Discovery of an Error in the Papers of Struve and Lord Rayleigh, Dealing with the Application of the Principles of the Wave Theory to the Determination of the Intensity of the Images of Fine Lines and Extended Areas at the Focus of a Telescope	7, 77
A Note on the Figuring and Use of the Eccentric and Unsymmetrical Forms of Parabolic Mirrors	7, 146
Notes on the Use of the Grating in Stellar Spectroscopic Work	7, 198
The Publications of the Allegheny Observatory	14, 66
The Theory of the Ocular Spectroscope	16, 1
Description of a New Type of Focal Plane Spectroscope and Its Application to Astronomical Spectroscopy	16, 12
On the Optical Conditions Required to Secure Maximum Accuracy of Measurement in the Use of the Telescope and Spectroscope. (See also Errata, 17, 163.)	16, 267; 17, 1, 100
On Measurements of Wave-Lengths with the Concave Grating Objective Spectroscope	18, 77
Review of: *On the Newtonian Constant of Gravitation*, C. V. Boys	3, 303
Review of: *Report of the Smithsonian Astrophysical Observatory for 1895*	3, 398
Review of: *On the Equipment of the Astrophysical Observatory of the Future*, G. Johnstone Stoney	4, 238
Review of: *Die Gravitations Constante, die Masse und mittlere Dichte der Erde*, Carl Braun	6, 159
WADSWORTH, F. L. O., and GEORGE E. HALE. See HALE and WADSWORTH	
WAIDNER, C. W. Physical Properties of X-Rays	5, 282
WALLACE, ROBERT JAMES. The Silver "Grain" in Photography	20, 113
Diffraction Grating Replicas	22, 123; 23, 96
Orthochromatic Plates	22, 153, 350

VOLUME AND PAGE

WALLACE, ROBERT JAMES (*Continued*)
Color-Filters for Astronomical Photography with Reflecting Telescopes 24, 268
Studies in Sensitometry. I. The Daylight Sensitometry of Photographic Plates, and a Suggested Standard Dispersion-Piece 25, 116
WANNER, H., and F. PASCHEN. See PASCHEN and WANNER
WELLMANN, VICTOR. On a Numerical Relation between Light and Gravitation 15, 282
WENDELL, O. C. Alvan Graham Clark 6, 136
WHITE, HENRY S. Review of: *Kollektivmasslehre*, G. T. Fechner . 10, 70
WHITNEY, MARY W. Observations of the Total Eclipse of May 28, 1900, by the Vassar College Party 12, 96
Review of: *Introduction to Astronomy*, Forest R. Moulton . 25, 151
WIEDEMANN, EILH., and G. C. SCHMIDT. Fluorescence of Sodium and Potassium Vapors, and Its Significance in Astrophysics 3, 207
WILCZYNSKI, E. J. Schmidt's Theory of the Sun 1, 112
Notes on Schmidt's Theory of the Sun 2, 69
Outlines of a Theory of Spiral and Planetary Nebulae . . 4, 97
Hydrodynamical Investigations of the Solar Rotation. (See also Correction, 4, 310.) 4, 101
On the Causes of the Sun-Spot Period 7, 124
On the Depth of the Reversing Layer 7, 213
WILSING, J. On the Law of the Sun's Rotation 3, 247
Theoretical Considerations Respecting the Dependence of Wave-Length on Pressure which Messrs. Humphreys and Mohler Have Observed in the Arc-Spectra of Certain Elements . 7, 317
On the Interpretation of the Typical Spectrum of the New Stars 10, 113
On the Effect of Pressure upon the Wave-Lengths of the Lines of the Hydrogen Spectrum 10, 269
WILSING, J., and J. SCHEINER. See SCHEINER and WILSING
WILSON, W. E. On the Effect of Pressure of the Surrounding Gas on the Temperature of the Crater of an Electric Arc Light 2, 212
Radiation from a Perfect Radiator 10, 80
WILSON, W. E., and G. F. Fitzgerald. On the Effect of Pressure in the Surrounding Gas on the Temperature of the Crater of an Electric Arc 5, 101
WISLICENUS, WALTER F. An Annual Report on the Progress of Astronomy 9, 118
WOOD, R. W. The Problem of the Daylight Observation of the Corona 12, 281
On the Production of a Line Spectrum by Anomalous Dispersion, and Its Application to the Flash Spectrum 13, 63
The Nature of the Solar Corona 13, 68

	VOLUME AND PAGE
WOOD, R. W. (*Continued*)	
On Screens Transparent Only to Ultra-Violet Light and Their Use in Spectrum Photography	17, 133
Photographic Reversals in Spectrum Photographs	17, 361
Intensity of Grating Spectra	21, 173
WOOD, R. W., and J. H. MOORE. The Fluorescence and Absorption Spectra of Sodium Vapor. (See also Erratum, 18, 235.)	18, 94
WRIGHT, W. H. A Method of Correcting the Curvature of Lines in the Spectroheliograph	5, 325
Review of: *Some Experiments on Helium*, Morris W. Travers	5, 363
Variations in the Spectrum of the *Orion* Nebula	6, 365
On the Wave-Length of the *Hδ* Line	9, 50
The Orbit of *η Aquilae*. (See also Errata, 9, 189.)	9, 59
Observations of Comet Spectra	10, 173
The Orbit of the Spectroscopic Binary *χ Draconis*	11, 131
The Velocity in the Line of Sight of *ε Leonis*	11, 414
The Auxiliary Apparatus of the Mills Spectrograph for Photographing the Comparison Spectrum	12, 274
A Determination of the Wave-Lengths of the Brighter Nebular Lines	16, 53
On Some Results Obtained by the D. O. Mills Expedition to the Southern Hemisphere	20, 140
A List of Twelve Stars Whose Radial Velocities Vary	21, 371
A List of Southern Stars Having Variable Radial Velocities	25, 56
The Variable Radial Velocity of *Antares*	25, 58
WRIGHT, W. H., and W. W. CAMPBELL. See CAMPBELL and WRIGHT	
WULF, TH., and J. D. LUCAS. Observations Made with Selenium Cells during the Total Solar Eclipse of August 30, 1905	23, 153
YOUNG, ANNE SEWELL. On the Density of the Solar Nebula	13, 338
YOUNG, C. A. On the Reversing Stratum and Its Spectrum, and on the Spectrum of the Corona	6, 155
The Wave-Length of the Corona Line	10, 306
Eclipse Observations by the Princeton Party at Wadesboro, N. C., May 28, 1900	12, 77
Review of: *Astronomical Discovery*, Herbert Hall Turner	21, 383
ZEEMAN, P. On the Influence of Magnetism on the Nature of the Light Emitted by a Substance	5, 332
On an Asymmetry in the Change of the Spectral Lines of Iron Radiating in a Magnetic Field	9, 47
Some Observations on the Resolving Power of the Michelson Echelon Spectroscope	15, 218
Observations on the Magnetic Rotation of the Plane of Polarization in the Interior of an Absorption Band	16, 106

INDEX OF SUBJECTS

VOLUME AND PAGE

ABERRATION, Effect of Atmospheric, on Intensity of Telescopic Images *F. L. O. Wadsworth* 7, 70
of Parabolic Mirrors. *Charles Lane Poor* 7, 114
ABSORPTION Bands in Infra-Red Spectrum, Earlier Observations of Atmospheric. *F. W. Very* 2, 237
Lines of Spectrum, Determination of Relative Quantities of Aqueous Vapor in Atmosphere by Means of. (See also Errata, 5, 218.) *Lewis E. Jewell* 4, 324
of Light as a Determining Factor in Selection of Size of Objective for Great Refractor of Potsdam Observatory. *H. C. Vogel* 5, 75
and Emission of Aqueous Vapor and Carbon Dioxide in the Infra-Red Spectrum. *H. Rubens* and *E. Aschkinass* . 8, 176
of the Visible Rays, Atmospheric. *A. Cornu* 13, 142
Selective, as a Function of Wave-Length. *George E. Hale* . 15, 227
Band, Magnetic Rotation of Plane of Polarization in Interior of. *P. Zeeman* 16, 106
Spectra of Sodium Vapor, Fluorescence and. (See also Erratum, 18, 235.) *R. W. Wood* and *J. H. Moore* . . . 18, 94
Bands of Solar Spectrum, Oxygen. *O. C. Lester* 20, 81
Remarks on the Foregoing Article. *George Higgs* . . . 22, 346
Spectra of Organic Compounds, Preliminary Communication on Infra-Red. *William W. Coblentz* 20, 207
Spectra, Dispersion Bands in. *W. H. Julius* 21, 271
Spectra, Ultra-Violet, in Relation to Physico-Chemical Processes. *E. C. C. Baly* and *C. H. Desch* 23, 110
of Some Solids for Light of Extremely Short Wave-Lengths. *Theodore Lyman* 25, 45
ABSORPTIVE Power of Solar Atmosphere. *Frank W. Very* . . 16, 73
ACCURACY of Measurement in Use of Telescope and Spectroscope, Optical Conditions Required to Secure Maximum. (See also Errata, 17, 163.) *F. L. O. Wadsworth* . . 16, 267; 17, 1, 100
AFTERGLOW and Fluorescence Phenomena in Vacuum Tubes Containing Nitrogen. *Percival Lewis* 12, 8
of Metallic Vapors in Nitrogen—A New Band Spectrum. *Percival Lewis* 20, 49
Algol System, Note on. *R. J. A. Barnard* 23, 406

VOLUME AND PAGE

Algol (*Continued*)
Variable +17° 4367 *W Delphini*. *Edward C. Pickering* 3, 77, 163, 200, 213; 4, 320; 7, 23
Variable, *SW Cygni*, 45° 3062. *Edward C. Pickering* . . 10, 126
Variable, *SY Cygni*. Mme. Ceraski's Second. *E. C. Pickering* 11, 165
Stars, Density of. *Henry Norris Russell* 10, 315
H. Seeliger. (See also Errata, 14, 215.) . 11, 247
J. H. Jeans 22, 93
Variables *RR Puppis* and *V Puppis*, Orbits of. *Alexander W. Roberts* 13, 177
Stars, Early Observations of. *Edward C. Pickering* . . 15, 229
Variable, *UZ Cygni*, +43° 4101. *Edward C. Pickering* . . 15, 343
Variable, *RV Lyrae*, 13. 1902, William's New. *Edward C. Pickering* 16, 337
Variable, *V Serpentis*, −15° 4905, A New. *Edward C. Pickering* 20, 296
ALKALI Metals, Some Additions to Arc Spectra of. *F. A. Saunders* 20, 188
ALKALINE-EARTH Fluorides in Electric Arc, Spectra of. *Ch. Fabry* 21, 356
ALLEGHENY Observatory, The New. *George E. Hale* . . . 9, 362
Publications of. *F. L. O. Wadsworth* 14, 66
ALLOYS, Spectra of. *P. G. Nutting* 22, 131
ALUMINIUM, Short Wave-Lengths of Spark-Spectrum of. *C. Runge* 1, 433
AMHERST Eclipse Expedition to Singkep, 1901. *David P. Todd* . 14, 362
AMMONIA, Influence of Atmosphere of, on Arc Spectra, Compared with That of Nitrogen and Hydrogen. *Royal A. Porter* . 15, 274
ANDERSON'S New Star in *Perseus*. *Edward C. Pickering* . . 13, 170
Andromeda, Nebula of. *E. E. Barnard* 8, 226
Edward C. Pickering 8, 262
Nebula, Spectrum of. *J. Scheiner* 9, 149
Nebula, Parallax of. *George E. Hale* 9, 184
T Andromedae. *E. C. Pickering* 1, 305
λ *Andromedae*, Variable Velocity of, in Line of Sight. *W. W. Campbell* 10, 178
Orbit of Spectroscopic Binary. *Keivin Burns* . . . 24, 345
ANOMALOUS DISPERSION and Solar Phenomena. *W. H. Julius* . 12, 185
Production of Line Spectrum by. *R. W. Wood* . . . 13, 63
of Light, Origin of Double Lines in Chromosphere Due to. *W. H. Julius* 15, 28
of Sunlight in Corona, Peculiarities and Changes of Fraunhofer Lines Interpreted as Consequences of. *W. H. Julius* . 18, 50
Spectroheliographic Results Explained by. *W. H. Julius* . 21, 278
Antares, The Variable Radial Velocity of. *W. H. Wright* . . 25, 58
ANTHRACENE and Phenanthrene Vapors, The Fluorescent and Absorption Spectra of. *T. Sidney Elston* 25, 155
S Antliae, Variable Star. *Edward C. Pickering* 9, 179

VOLUME AND PAGE

APOLOGY and Explanation. *F. R. Moulton* 22, 355
APPROACH, Disruptive, Possible Function of, in Formation of Meteorites, Comets, and Nebulae. *T. C. Chamberlin* 14, 17
AQUEOUS VAPOR in the Atmosphere, Determination of Relative Quantities of, by Means of Absorption Lines of Spectrum. (See also Errata, 5, 218.) *Lewis E. Jewell* 4, 324
in the Atmosphere, Dr. Arendt's Spectroscopic Investigation of Variation of. *Lewis E. Jewell* 5, 279
Note on the Foregoing Article. *Edwin B. Frost* 6, 57
Absorption and Emission of, in Infra-Red Spectrum. *H. Rubens* and *E. Aschkinass* 8, 176
Aquila. See also *Nova Aquilae*
Distribution of Stars and Distance of Milky Way in. *C. Easton* 1, 216
RS Aquilae, New Variable Star. *M. Fleming* 2, 354
η Aquilae, Spectrum of. *A. Belopolsky* 6, 393
Orbit of. (See also Errata, 9, 189.) *W. H. Wright* . . 9, 59
Y Aquilae, Supposed Variable Star. *Edward C. Pickering* . . 8, 57
α Aquilae, Spectrum of, and Its Velocity in Line of Sight. *H. C. Vogel* 9, 1
ARC. See also SPECTRUM and SPECTRA
Light, Effect of Pressure of Surrounding Gas on Temperature of Crater of Electric. *W. E. Wilson* 2, 212
W. E. Wilson and *G. F. Fitzgerald* . 5, 101
Studies of Electric. *Henry Crew* 6, 418
in High Vacua. *R. E. Loving* 22, 285
Arcturus, Heat Radiation of. *E. F. Nichols* 13, 101
Sun-Spot Lines in Spectrum of. *Walter S. Adams* . . . 24, 69
ARENDT'S Spectroscopic Investigation of Variation of Aqueous Vapor in Atmosphere. *Lewis E. Jewell* 5, 279
Note on the Foregoing Article. *Edwin B. Frost* 6, 57
ARGON, Note on Spectrum of. *H. F. Newall* 1, 372
Spectra of. *H. Kayser* 4, 1
Red Spectrum of. *J. R. Rydberg* 6, 338
Spectrum, Red End of Red. *C. Runge* 9, 281
in the Chromosphere. *S. A. Mitchell* 17, 224
Lines in Air, Conditions Attending Appearance of. *A. S. King* 21, 344
26 Arietis, Occultation of, Observed Photographically. *Edward C. Pickering* 7, 306
β Arietis, Orbit of Spectroscopic Binary. (See also Errata, 26, 382.) *H. Ludendorff* 25, 320
ASPECTS of American Astronomy. *Simon Newcomb* 6, 289
ASTEROIDS, New Method for Discovery of. *Joel H. Metcalf* . . . 23, 306
and Satellites, Light-Variations of. *Henry Norris Russell* . 24, 1

VOLUME AND PAGE

ASTEROIDS (*Continued*)
A Photographic Method for the Detection of Variability in. *Joel H. Metcalf* 25, 264
ASTRONOMERS and Astrophysicists, Harvard Conference of. *George E. Hale* 8, 54, 193
and Astrophysicists, Proceedings of Second Conference of . 8, 229
and Astrophysicists, Third Conference of. *George C. Comstock* . 10, 58
George E. Hale . 10, 211
ASTRONOMICAL and Astrophysical Society of America . . . 23, 166
ASTRONOMY, Aspects of American. *Simon Newcomb* . . . 6, 289
Annual Report on Progress of. *Walter F. Wislicenus* . . 9, 118
ASTROPHOTOGRAPHIC Work, Maximum Efficiency in. *F. L. O. Wadsworth* 6, 119; 7, 70
ASTROPHYSICAL Investigations, Comparative Value of Refracting and Reflecting Telescopes for. *George E. Hale* . . . 5, 119
ASTROPHYSICAL JOURNAL. *George E. Hale* 1, 80
Action of Editorial Board with Regard to Standards in Astrophysics and Spectroscopy 3, 1
Miss Bruce's Gift to 3, 150
Change in Time of Publication of 11, 100
Grant by Smithsonian Institution to . . . 15, 297; 21, 81
New Collaborators of 17, 81
ASTROPHYSICISTS, Harvard Conference of Astronomers and. *George E. Hale* 8, 54, 193
Proceedings of Second Conference of Astronomers and . . 8, 229
Third Conference of Astronomers and. *George C. Comstock* . 10, 58
George E. Hale . . 10, 211
ASTROPHYSICS and Spectroscopy, Action of Editorial Board of Astrophysical Journal with Regard to Standards in . . . 3, 1
Application of Messrs. Jewell, Humphreys, and Mohler's Results to Certain Problems of. *George E. Hale* 3, 156
Fluorescence of Sodium and Potassium Vapors, and Its Significance in. *Eilh. Wiedemann* and *G. C. Schmidt* . . 3, 207
Relation of, to Other Physical Sciences. *James E. Keeler* . 6, 271
Arbitrary Distribution of Light in Dispersion Bands, and Its Bearing on Spectroscopy and. *W. H. Julius* . . . 25, 95
ASYMMETRY in Change of Spectral Lines of Iron Radiating in a Magnetic Field. *P. Zeeman* 9, 47
Atlas Stellarum Variabilium. Specimen Chart from the. *John G. Hagen* 8, 160
ATLAS Chart for *T Orionis* Extended. *John G. Hagen* . . . 20, 351
ATMOSPHERE, On Determining Extent of a Planet's. *W. W. Campbell* 1, 85

VOLUME AND PAGE

ATMOSPHERE (*Continued*)
Brester's Views as to the Tranquillity of the Solar. *Egon von Oppolzer* 1, 260
Pressure of Reversing Layer of Solar. *L. E. Jewell, J. F. Mohler,* and *W. J. Humphreys* 3, 138
Determination of Relative Quantities of Aqueous Vapor in, by Means of Absorption Lines of Spectrum. (See also Errata, 5, 218.) *Lewis E. Jewell* 4, 324
Dr. Arendt's Spectroscopic Investigation of the Variation of Aqueous Vapor in. *Lewis E. Jewell* 5, 279
Note on the Foregoing Article. *Edwin B. Frost* 6, 57
New Gases in Earth's. *Edwin B. Frost* 8, 121
Presence of Helium in Earth's, and Its Relation to Kinetic Theory of Gas. *G. Johnstone Stoney* 8, 316
Solar. *Arthur Schuster* 16, 320
Absorptive Power of Solar. *Frank W. Very* 16, 73
Absorption of Radiation by Solar. *Frank W. Very* 19, 139
Radiation through a Foggy. *Arthur Schuster* 21, 1
Temperature of Solar. *Arthur Schuster* 21, 258
Optical Power of, and Its Measurement. *Karl Exner* and *W. Villiger*. 21, 368
ATMOSPHERES upon Planets and Satellites. (See also Errata, 8, p. vii.) *G. Johnstone Stoney* 7, 25
Escape of Gases from Planetary. *S. R. Cook* 11, 36
Escape of Gases from. *G. Johnstone Stoney* 11, 251, 357; 12, 201; 20, 69
of the Planets and the Sun, Temperature and Composition of. (See also Errata, 15, 69.) *E. Rogovsky* 14, 234
ATMOSPHERIC Aberration, Effect of, on Intensity of Telescopic Images. *F. L. O. Wadsworth* 7, 70
Absorption of the Visible Rays, Determined from Spectroscopic Observations of the Eiffel Tower Electric Lights in 1889. *A. Cornu* 13, 142
Aurigae, Recent Changes in Spectrum of *Nova*. *W. W. Campbell* 1, 49
Campbell's Observations of *Nova*. *E. E. Barnard* . . . 5, 277
β Aurigae, K Lines of. *Antonia C. Maury* 8, 173
System of Spectroscopic Binary. *H. C. Vogel* 19, 360
ε Aurigae a Spectroscopic Binary. *H. C. Vogel* 17, 243
Radial Velocity of. *W. W. Campbell* and *Heber D. Curtis* . 21, 191
1921 *W Aurigae*, Variable Star. *J. A. Parkhurst* 18, 309
AURORA, Spectrum of the. *W. W. Campbell* 2, 162
C. Runge 18, 381
E. C. C. Baly 19, 187

	VOLUME AND PAGE
AURORA (*Continued*)	
Photographic Spectrum of. *Edward C. Pickering*	7, 392
Observations of, at the Yerkes Observatory, 1897–1902. *E. E. Barnard*	16, 135
BAND, Magnesium, at λ 5007. *H. Crew* and *O. H. Basquin*	2, 100
B in Stellar Spectra. *W. W. Campbell*	2, 163
Magnetic Rotation of Plane of Polarization in the Interior of an Absorption. *P. Zeeman*	16, 106
Regularities in Structure of Third Cyanogen. *Franz Jungbluth*	20, 237
Oxygen Absorption, of Solar Spectrum. *George Higgs*	22, 346
BANDS in Spectrum of *Mars*, Note on Atmospheric. *William Huggins*	1, 193
Atmospheric Absorption, in the Infra-Red Spectrum. *F. W. Very*	2, 237
Some New Peculiarities in Structure of Cyanogen. *A. S. King*	14, 323
New Heads to Cyanogen. *C. C. Hutchins*	15, 310
Nitrogen Bands vs. New Heads to Cyanogen. *Percival Lewis* and *A. S. King*	16, 162
of Solar Spectrum, Oxygen Absorption. *O. C. Lester*	20, 81
Remarks on the Foregoing Article. *George Higgs*	22, 346
in Absorption Spectra, Dispersion. *W. H. Julius*	21, 271
in Spectra of δ *Orionis* and *Nova Persei*, Dispersion. *W. H. Julius*	21, 286
Reversal of. *W. J. Humphreys*	22, 220
Arbitrary Distribution of Light in Dispersion, and Its Bearing on Spectroscopy and Astrophysics. *W. H. Julius*	25, 95
BARIUM Sulphide, Preparation of Phosphorescent. *F. L. O. Wadsworth*	4, 308
BARNARD, Award of Gold Medal of Royal Astronomical Society to Professor. *George E. Hale*	5, 215
BELGIAN Astronomical Society	2, 168
BELL, Louis, Reply to Recent Article by. *A. Perot* and *C. Fabry*	16, 36
BERYLLIUM, Arc-Spectra of. *H. A. Rowland* and *R. R. Tatnall*	1, 14
BIGELOW'S "Eclipse Meteorology," Remarks on. *Egon von Oppolzer*	16, 334
Reply to the Foregoing Article. *Frank H. Bigelow*	17, 161
BINARIES, SPECTROSCOPIC. See SPECTROSCOPIC BINARIES.	
BINARY System δ *Equulei*, Parallax of. *William J. Hussey*	17, 378
Systems and Their Relation to Short Period Variations, Close. *Alexander W. Roberts*	2, 283
See also DOUBLE STARS	
BODIES, Constitution of Gaseous Celestial. *A. Ritter*	8, 293

VOLUME AND PAGE

BODY, Distribution of Energy at Low Temperatures, in Spectrum of Black. *F. Paschen* 10, 40
Maximum in Spectral Energy-Curve of Black. *Frank W. Very* 10, 208
Distribution of Energy in Spectrum of Black, at High Temperatures. *F. Paschen* 11, 288
Radiation of a Black. *C. E. Mendenhall* and *F. A. Saunders* . 13, 25
Heat Radiation of Long Wave-Length Emitted by Black. *H. Rubens* and *F. Kurlbaum* 14, 335
Measurement of Extreme Temperatures and the Black. *Arthur L. Day* and *C. E. Van Orstrand* 19, 1
BOLOGRAPHIC Investigations at the Smithsonian Astrophysical Observatory, Spectro-. *George E. Hale* 1, 162
BOLOMETER, Thermal Measurements with, by Zero Method. *F. L. O. Wadsworth* 5, 268
BOLOMETERS, Balancing Rheostat for. *P. G. Nutting* 11, 44
BOLOMETRIC Purposes, A Sensitive Galvanometer for Spectro-. *C. G. Abbot* 18, 1
BOOKS Received 21, 295; 24, 370
BORON, Arc-Spectra of. *H. A. Rowland* and *R. R. Tatnall* . . 1, 14
BORRELLY, Photographic Observations of Comet 1903 IV, and Explanation of Phenomenon of the Tail on July 24. *E. E. Barnard* 18, 210
Photographic Observations of Comet 1903 IV. *Sebastian Albrecht* 19, 121
Light-Pressure and Comet 1903 IV. *S. A. Mitchell* . . 20, 63
BREWSTER'S Views as to Tranquillity of Solar Atmosphere. *Egon von Oppolzer* 1, 260
BRIGHTNESS of Surfaces, Photographic Measurement of. *J. Hartmann* 10, 321
of Inner Edge of Penumbra in Sun-Spots. *S. Chevalier* 24, 278; 25, 273
BROADENING of Spectral Lines. *A. A. Michelson* 2, 251
BROMIDE of Silver Gelatine, Effect of Intermittent Exposure on. *K. Schwarzschild* 11, 92
of Silver Gelatine, Deviations from the Law of Reciprocity for. *K. Schwarzschild* 11, 89
BROOKS'S Comet 1898 I [X], Photographs of, Made with Crossley Reflector of Lick Observatory. *James E. Keeler* . . . 8, 287
BRUCE Spectroscope of the 25-Inch Refractor of the Cambridge Observatory. *H. F. Newall* 3, 266
BRUCE SPECTROGRAPH of the Yerkes Observatory. *Edwin B. Frost* 15, 1
Some Results with. *Walter S. Adams* 15, 214
Miscellaneous Radial Velocity Determinations with. *W. S. Adams* 18, 67
Observations with. *Edwin B. Frost* and *Walter S. Adams* . 19, 350
BRUCE Photographic Telescope. *E. E. Barnard* 21, 35

VOLUME AND PAGE

BRUCE'S, Miss, Gift to the Astrophysical Journal 3, 150
BUNSEN Flame, Effects of Sodium on Hydrocarbon Bands in Spectrum of. *Percival Lewis* 15, 122
CADMIUM Line of Wave-Length 4800, Shift of, Due to Pressure. *William B. Huff* 14, 41
Line at λ 5086, Wave-Length of. *Charles Fabry* . . . 19, 116
CAESIUM, Potassium, and Rubidium, Spectra of. *Hugh Ramage* . 16, 43
Some Additions to Arc Spectrum of. *F. A. Saunders* . . 20, 188
CALCIUM, Relative Behavior of H and K Lines of Spectrum of. *Sir William* and *Lady Huggins* 6, 77
and Hydrogen Flocculi. *George E. Hale* and *Ferdinand Ellerman* 19, 41
and Strontium, Narrow Triplets in Spectra of. *F. A. Saunders* 21, 195
Vapor in the Sun, Motion of. *Walter S. Adams* . . . 23, 45
CALIBRATION of the Slit in Spectral Photometric Measurements. *E. V. Capps* 11, 25
of a Wedge Photometer. *James D. Maddrill* 22, 138
CAMBRIDGE Observatory, Bruce Spectroscope of the 25-Inch Refractor of. *H. F. Newall* 3, 266
CAMPBELL, W. W., Appointment as Director of Lick Observatory. *George E. Hale* 12, 381
CANAL RAYS in Hydrogen. On the Radiation of. *J. Stark* . 25, 23, 170
On Hull's Observations of Doppler Effect in. *J. Stark* . . 25, 230
Doppler Effects and Polarization in. *G. F. Hull* . . . 25, 234
κ *Cancri*, Orbit of Spectroscopic Binary. (See also Errrata, 26, 382.) *Naozo Ichinohe* 25, 315
CAPACITY and Self-Induction upon Wave-Length in Spark Spectrum, Effect of. *George W. Middlekauff* 21, 116
Capella, Spectroscopic Binary. *W. W. Campbell* 10, 177
System of. (See also Errata, 11, 415.) *J. Miller Barr* . . 11, 248
Observations of Spectroscopic Binary. *W. W. Campbell* . . 14, 261
Determination of Orbit of. *H. M. Reese* 14, 263
β *Capricorni*, Variable Velocity of, in Line of Sight. *W. W. Campbell* 10, 241
δ *Capricorni*, Variable Radial Velocity of. *V. M. Slipher* . . 24, 361
ε *Capricorni*, Spectrum of. *V. M. Slipher* 25, 285
CARBON, Spectrum of. *H. Crew* and *O. H. Basquin* 2, 103
in the Chromosphere. *George E. Hale* 6, 412
Band-Spectrum, Resolution into Series of Third Band of. *T. N. Thiele* 8, 1
Dioxide, Absorption and Emission of, in the Infra-Red Spectrum. *H. Rubens* and *E. Aschkinass* 8, 176
in the Chromosphere. *George E. Hale* 10, 287

VOLUME AND PAGE

CARBON (*Continued*)
Thermal Development of Spark Spectrum of. *Henry Crew* and *John C. Baker* 16, 61
Line λ 4267, Wave-Length of. *J. Hartmann* 18, 65
CARBONYL Group, Chemical Reactivity of, as Measured by Its Absorption Spectrum. *A. W. Stewart* and *E. C. C. Baly* . . 24, 95
Carinae, New Star *RS*. *Edward C. Pickering* 2, 320
η Carinae, Spectrum of. *Edward C. Pickering* 14, 82
CARNEGIE Institution. See SOLAR OBSERVATORY
Castor, System of. *Heber D. Curtis* 23, 351
CATANIA, Photograph of Nebula near *42 Orionis* Made at. *A. Riccò* . 2, 164
Solar Observations Made at, 1894–96. *A. Mascari* 2, 119; 4, 205; 6, 371
Astrophysical Observatory, Work of. *A. Riccò* 6, 453
CATHODO-LUMINESCENT Metallic Vapors, Spectra of. *Percival Lewis* 16, 31
CATHODO-LUMINESCENCE and Negative-Pole Spectrum of Nitrogen. *Percival Lewis* 17, 258
CAUSTIC of the Right Parabolic Cylinder. *C. W. Crockett* . . 7, 358
CELESTIAL Photographs with a "Magic Lantern" Lens. *E. E. Barnard* 2, 351
CEMENTED Doublets, Theory of. *Henry C. Lomb* 24, 263
W and *Y Centauri*, New Variable Stars. *M. Fleming* . . . 2, 354
Z Centauri, New Star. *Edward C. Pickering* . . . 3, 162, 214
β Cephei, Spectroscopic Binary. *Edwin B. Frost* 15, 340
Period of. *Edwin B. Frost* 24, 259
δ Cephei, Spectrum of. *A. Belopolsky* 1, 160
Short Period Variable. *L. A. Eddie* 3, 227
U Cephei, Variable Radial Velocity of. *V. M. Slipher* . . . 25, 284
X Cephei, Variable Star. (See also Errata, 17, 163.) *J. A. Parkhurst* 17, 48
CERASKI'S, Mme., Second *Algol* Variable. *Edward C. Pickering* . 11, 165
X Ceti, New Variable Star. *M. Fleming* 2, 354
o Ceti, Spectrum of. *W. W. Campbell* 9, 31
Joel Stebbins 18, 341
V. M. Slipher 25, 66, 235
CHART from the *Atlas Stellarum Variabilium*, A Specimen. *J. G. Hagen* 8, 160
CHICAGO Academy of Sciences, Meeting of the Section of Mathematics, Astronomy, and Physics, December 11, 1894. *T. J. J. See* . 1, 86
Chicago, Planet 344. *Kurt Laves* 6, 450
CHLORINE, Absorption Spectrum of. *Elizabeth R. Laird* . 14, 85, 215
CHROMOSPHERE, Wave Length of D_3 Line in Spectrum of. *George E. Hale* 2, 165, 384
Frequency of H and K Lines in Spectrum of. *George E. Hale* 6, 157
Carbon in. *George E. Hale* 6, 412; 10, 287

	VOLUME AND PAGE
CHROMOSPHERE (*Continued*)	
Origin of Some Lines in Spectrum of. *W. N. Hartley*	11, 163
Prominence of Titanium Lines in. *Lewis E. Jewell*	11, 243
Origin of Double Lines in Spectrum of. *W. H. Julius*	15, 28
New Gases Neon, Argon, Krypton, and Xenon in. *S. A. Mitchell*	17, 224
CHROMOSPHERIC Line near K. *Lewis E. Jewell*	8, 119
CIRCUIT Conditions, Effect of, upon Wave-Lengths of Spark Lines. *Norton A. Kent*	17, 286
CLASSIFICATION of Stars of First Spectral Type. *H. C. Vogel*	2, 333
CLÈVEITE, Presence of Helium in. *George E. Hale*	2, 76
Gas, Occurrence in Stellar Spectra of Lines of. *H. C. Vogel*	2, 333
Gas, Spectrum of. *C. Runge* and *F. Paschen*	3, 4
Gas, New Elements of. *J. R. Rydberg*	4, 91
CLUSTER *Messier 13*, Distribution of Stars in. *H. K. Palmer*	10, 246
Messier 5, Periods of Variable Stars in. *S. I. Bailey*	10, 255
M 13 Herculis, Some Abnormal Stars in. *E. E. Barnard*	12, 176
M 13 Herculis, Variable Star in. *E. E. Barnard*	12, 182
CLUSTERS, Distribution of Stars in. *Edward C. Pickering*	5, 352
Variable Star. *Edward C. Pickering*	2, 321; 6, 258; 7, 208
Variable Stars in. *Edward C. Pickering*	8, 257
Variable Stars in. Rate of Increase of Light. *Edward C. Pickering*	12, 159
Photographs of, Made with 40-Inch Visual Telescope. *George E. Hale*	12, 161
Note Concerning Publication of Crossley Reflector Photographs of Nebulae and Star. *W. W. Campbell*	20, 295
Division of Stars in Some of the Globular, According to Magnitude. *C. D. Perrine*	20, 354
COBALT, Arc-Spectra of. *B. Hasselberg*	4, 288, 343; 5, 38
COELOSTAT Telescope, A Vertical. *George E. Hale*	25, 68
COHERERS, On the Action of. *G. F. Hull*	6, 141
COLOR Filters for Astronomical Photography with Reflecting Telescopes. *Robert James Wallace.*	24, 268
-Photography, Review of Recent Papers on. *N. E. Dorsey*	5, 291
Origin of. *E. C. C. Baly* and *A. W. Stewart*	24, 133
COLUMBIA University Observatory, Work of. *J. K. Rees*	6, 431
COMET 1892 III (Holmes), Photographic and Visual Observations of. *E. E. Barnard*	3, 41
1898 X (Brooks). Photographs Made with Crossley Reflector of Lick Observatory. *James E. Keeler*	8, 287
Spectra, Observations of. *W. H. Wright*	10, 173
Photography with Two-Foot Reflector. *G. W. Ritchey*	16, 178
1902 III (Perrine), Transparency of. *Edward C. Pickering*	17, 245

VOLUME AND PAGE

COMET (*Continued*)
1903 IV (Borrelly), Photographic Observations of, and Explanation of Phenomenon of the Tail of July 24. *E. E. Barnard* 18, 210
1903 IV (Borrelly), Photographic Observations of. *Sebastian Albrecht* 19, 121
1903 IV (Borrelly) and Light-Pressure. *S. A. Mitchell* . . 20, 63
1903 IV (Borrelly), Motion of Matter Composing Tail of. *R. Jaegermann* 21, 323
1906 I (Giacobini), Photographic Observations of. *E. E. Barnard* 24, 255
COMETS' Tails, Electrical Theory of. *Reginald A. Fessenden* . . 3, 36
COMETS, Possible Function of Disruptive Approach in Formation of. *T. C. Chamberlin* 14, 17
Anomalous Tails of. *E. E. Barnard* 22, 249
Application of Radiation Pressure to Theory of. *E. F. Nichols* and *G. F. Hull* 17, 352
COMPOUNDS, Preliminary Communication on Infra-Red Absorption Spectra of Organic. *William W. Coblentz* . . . 20, 207
CONFERENCE at Yerkes Observatory, October, 1897, Proceedings of 6, 415
at Harvard College Observatory, Astronomical and Physical. *George E. Hale* 8, 54
of Astronomers and Astrophysicists, The Harvard. *George E. Hale* 8, 193
of Astronomers and Astrophysicists, Proceedings of Second . 8, 229
of Astronomers and Astrophysicists, Third. *George C. Comstock* 10, 58
George E. Hale 10, 211
CONSTANT Speed, The Design of Electric Motors for. *F. L. O. Wadsworth* 1, 169
Solar, and Related Problems. *S. P. Langley* 17, 89
CONSTANTS for Principal Stars, Line of Sight. *Frank Schlesinger* . 10, 1
For Some Stars of the *Orion* Type, Line of Sight. *Emily Elisabeth Dobbin* 19, 382
CONSTITUTION of Gaseous Celestial Bodies. *A. Ritter*. . . . 8, 293
COOLING of Very Hot Stars, Spectral Phenomena Connected with. *H. Kayser* 14, 313
Remarks on the Foregoing Article. *J. Scheiner* . . . 15, 342
CO-OPERATION in Observing Radial Velocities of Selected Stars. *Edwin B. Frost* 16, 169
in Solar Research, International. *C. D. Perrine* . . . 20, 301
in Solar Research. *George E. Hale* 20, 306
COPPER, Arc-Spectrum of. *H. Kayser* 1, 84
Triplets with Constant Differences in Line Spectrum of. *J. R. Rydberg* 6, 239

	VOLUME AND PAGE
COPPER (*Continued*)	
Spectrum of Hydrogen Given by Metallic Arc of. *O. H. Basquin*	14, 1
Detailed Study of Line Spectrum of. *A. S. King*	20, 21
CORONA, On Some Attempts to Photograph, without an Eclipse, Made at the Mount Etna Observatory. *A. Ricco*	1, 18
New Method of Mapping, without an Eclipse. *George E. Hale*	1, 318
Exposure Required in Photographing, without an Eclipse. *George E. Hale*	1, 438
Huggins Method of Photographing, without an Eclipse. *George E. Hale*	2, 77
Automatic Photography of. *D. P. Todd*	5, 318
Spectrum of. *C. A. Young*	6, 155
Rotation of Solar. *W. W. Campbell*	10, 186
Line, Wave-Length of. *C. A. Young*	10, 306
Suggested Explanation of. *J. Scheiner*	12, 25
Note on the Foregoing Article. *Sir William Huggins*	12, 279
Daylight Observation of. *R. W. Wood*	12, 281
Observation of, without an Eclipse, by Means of Heat Rays. *H. Deslandres*	12, 366
Heat Radiation of. *S. P. Langley*	12, 370
Attempts to Detect, in Full Sunlight with Bolometer. *G. E. Hale*	12, 372
Nature of. *R. W. Wood*	13, 68
Lines, Ultra-Violet. *K. D. Naegamvala*	13, 240
of 1901, Origin of Disturbed Region Observed in. *C. D. Perrine*	15, 147
Peculiarities and Changes of Fraunhofer Lines Interpreted as Consequences of Anomalous Dispersion of Sunlight in. *W. H. Julius*	18, 50
Physical Nature of. *Svante Arrhenius*	20, 224
Comparative Luminosity and Total Radiation of. *S. P. Langley*	21, 194
Connection between Disturbed Areas of Solar Surface and. *A. L. Cortie*	24, 355
Coronae, Nova T, of 1866. *E. E. Barnard*	25, 279
CROCKER Expedition of Lick Observatory, Spectrographic Results Obtained at the Indian Eclipse by. *W. W. Campbell*	11, 226
Eclipse Expeditions in 1905. *W. W. Campbell*	20, 235
CROSSLEY REFLECTOR, Photographs of Comet X, 1898 (Brooks), Made with. *James E. Keeler*	8, 287
of Lick Observatory. (See also Correction, **16**, 121.) *James E. Keeler*	11, 325
Examination of *Pleiades* and *Eros* Plates Taken with. *J. K. Rees*	13, 48
of Lick Observatory, Application of, to Study of Very Faint Spectra. *Harold King Palmer*	18, 218

VOLUME AND PAGE

CROSSLEY REFLECTOR (*Continued*)
Spectrographic Observations of *Novae* with. *C. D. Perrine* . 19, 80
Photographs of Nebulae and Star Clusters. Note Concerning Publication of. *W. W. Campbell* 20, 295
U Crucis, New Variable Star. *Edward C. Pickering* 4, 369
β Crucis, Comparison of Oxygen with Extra Lines in Spectrum of. *Frank McClean* 7, 367
Type, Spectra of Stars of. *Joseph Lunt* 11, 262
CURVATURE of Lines in Spectroheliograph, Method of Correcting. *W. H. Wright* 5, 325
of Spectral Lines. *H. C. Lord* 5, 348
of Spectral Lines in the Spectroheliograph. *W. S. Adams* . . 11, 309
CURVES, Light, of Variable Stars of Short Period, Relation between Visual and Photographic. *S. I. Bailey* 10, 261
CYANOGEN Bands, New Peculiarities in Structure of. *A. S. King* . 14, 323
Bands, New Heads to. *C. C. Hutchins* 15, 310
Bands in Arc Spectra, Nitrogen Bands vs. New Heads to. *Percival Lewis* and *A. S. King* 16, 162
Band, Regularities in Structure of Third. *Franz Jungbluth* . 20, 237
ε Cygni, Photographs of Milky Way Near. *E. E. Barnard* . . 2, 58
SS Cygni, New Variable Star. *Edward C. Pickering* . . . 4, 369
J. A. Parkhurst and *Zaccheus Daniel* 12, 259
ST Cygni, Variable Star. *Edward C. Pickering* 9, 179
SW Cygni, New *Algol* Variable. *Edward C. Pickering* . . . 10, 126
P Cygni, Spectrum of. A. *Belopolsky* 10, 319
SY Cygni, Mme. Ceraski's Second *Algol* Variable. *Edward C. Pickering* 11, 165
Y Cygni, Elliptic Elements of System of. *N. C. Dunér* . . 11, 175
Observations and Ephemerides of. *N. C. Dunér* . . . 14, 149
χ Cygni, Spectrum and Radial Velocity of. *G. Eberhard* . . 18, 198
W Cygni, Spectrum of. *Ralph H. Curtiss* 20, 232
Cygnus, Distribution of Stars and Distance of Milky Way in. *C. Easton* 1, 216
Annular Nebula *H. IV 13* in. *James E. Keeler* . . . 10, 266
CYLINDER, Caustic of the Right Parabolic. *C. W. Crockett* . . 7, 358
W Delphini, *Algol* Variable, +17° 4367. *E. C. Pickering* 3, 200, 213; 4, 320; 7, 23
DESIDERATUM in Spectrology. *Edwin B. Frost* 20, 342
DESLANDRES, Reply to Recent Statements by M. *George E. Hale* 23, 92
DIFFRACTION by Light of Variable Intensity. *H. M. Reese* . . 13, 199
at a Narrow Slit, Loss of Light by. *J. H. Moore* . . . 20, 285
Grating Replicas. *Robert James Wallace* 22, 123
DISCHARGE, Spark, from Metallic Poles in Water. *Sir Norman Lockyer* 15, 190

VOLUME AND PAGE

DISCHARGE (*Continued*)
Spark, Modifications of Magnesium Line at λ 4481 under Different Laboratory Conditions of. *Sir William* and *Lady Huggins* 17, 145
Velocity of Metallic Particles in Spark. *Arthur Schuster* . . 25, 277
DISPERSION, Prism of Uniform. *Charles G. Abbot* and *Frederick E. Fowle, Jr.* 11, 135
Solar Phenomena and Anomalous. *W. H. Julius* . . . 12, 185
Production of Line Spectrum by Anomalous. *R. W. Wood* . 13, 63
and Refraction, Graphical Study of. *A. De Gramont* . . 13, 208
of Light, Origin of Double Lines in Chromosphere Due to Anomalous. *W. H. Julius* 15, 28
of Sunlight in the Corona, Peculiarities and Changes of Fraunhofer Lines Interpreted as Consequences of Anomalous. *W. H. Julius* 18, 50
Bands in Absorption Spectra. *W. H. Julius* 21, 271
Spectroheliographic Results Explained by Anomalous. *W. H. Julius* 21, 278
Bands in Spectra of *δ Orionis* and *Nova Persei*. *W. H. Julius* 21, 286
Bands, Arbitrary Distribution of Light in, and Its Bearing on Spectroscopy and Astrophysics. *W. H. Julius* . . . 25, 95
DISPERSION-PIECE, The Daylight Sensitometry of Photographic Plates, and a Suggested Standard. Studies in Sensitometry. I. *Robert James Wallace* 25, 116
DISPLACEMENT of Spectral Lines Caused by Rotation of a Planet. *James E. Keeler* 1, 352
of Spectral Lines, Michelson's Theory of. *J. Fényi*. . . . 19, 70
DISRUPTIVE Approach in Formation of Meteorites, Comets, and Nebulae, Possible Function of. *T. C. Chamberlin* . . . 14, 17
DISTANCES, Solar Motion as Gauge of Stellar. *Simon Newcomb* . 6, 441
DISTORTION Due to Lens in Projection Drawing. *Frederick Slocum* 6, 259
of Photographic Films on Glass. *Sebastian Albrecht* . . 25, 349
DISTRIBUTION of the Stars and the Distance of the Milky Way in *Aquila* and *Cygnus*. *C. Easton* 1, 216
DOME, A Combination Telescope and. *A. E. Douglass* . . . 1, 401
DOPPLER-FIZEAU Principle, Apparatus for Laboratory Demonstration of. *A. Belopolsky* 13, 15
DOPPLER Effect and Reversal in Spark Spectra. *John Fred Mohler* 15, 125
Effect in Canal Rays, Remarks on Hull's Observations of. *J. Stark* 25, 230
Effects and Polarization in Canal Rays. *G. F. Hull* . . . 25, 234
DOPPLER'S Principle. *W. Michelson* 13, 192

VOLUME AND PAGE

DOUBLE STARS, Southern. *Edward C. Pickering* 6, 258
Density of. *Alexander Roberts* 10, 308
Showing Contrasted Colors, Interpretation of Spectra of. *Sir William* and *Lady Huggins* 25, 65
See also BINARY and SPECTROSCOPIC BINARIES
DOUBLETS, Theory of Cemented. *Henry C. Lomb* 24, 263
χ *Draconis*, Variable Velocity of, in Line of Sight. *W. W. Campbell* 8, 292
Orbit of Spectroscopic Binary. *W. H. Wright* . . . 11, 131
θ *Draconis*, Variable Velocity of, in Line of Sight. *W. W. Campbell* 9, 311
h Draconis, Variable Velocity of, in Line of Sight. *W. W. Campbell* 10, 178
ω *Draconis*, Variable Velocity of, in Line of Sight. *W. W. Campbell* 10, 178
DURCHMUSTERUNG Charts, Northern. *J. G. Hagen* 7, 145
Northern. *Edward C. Pickering, J. G. Hagen, M. B. Snyder* . 7, 295
Correspondence of Photographic, with Visual. *R. H. Tucker* 7, 330
DYNAMICS, Attempt to Test the Nebular Hypothesis by an Appeal to the Laws of. *F. R. Moulton* 11, 103
EARTH'S Atmosphere, New Gases in. *Edwin B. Frost* . . . 8, 121
Atmosphere, Presence of Helium in. *G. Johnstone Stoney* . 8, 316
ECHELON Spectroscope. *A. A. Michelson* 8, 37
Spectroscope, Observations on Resolving Power of the Michelson. *P. Zeeman* 15, 218
ECLIPSE OF SUN. See also CORONA and FLASH
1896, April 16. Report of Observations Relating to Solar Physics. *J. Norman Lockyer* 4, 81
1898, January 21. Abstract of Some Preliminary Reports. *George E. Hale* 7, 304
Photograph of Spectrum of "Flash." (See also Correction, 8, 198.) *K. D. Naegamvala* 8, 120
Spectrographic Results Obtained at Indian. *W. W. Campbell* 11, 226
Wave-length Determinations and General Results Obtained at. *J. Evershed* 13, 223
1900, May 28. Eclipse Track Report on Cloud Conditions of. *Frank H. Bigelow* 10, 220
Proposal for Photometric Observation of *Mercury* during. *G. Müller* 11, 144
Plans of American Eclipse Parties 11, 314
Reports Contained in Vol. 12:
Brown University. *Winslow Upton* 89
Coit, J. B 97
Crockett, C. W. 92
Deslandres, H. 287
Frost, Edwin B. 307
Georgetown College. *J. G. Hagen* 101

VOLUME AND PAGE

ECLIPSE OF SUN (*Continued*)
1900, May 28. Reports contained in Vol. 12 (*Continued*)
Harvard College Observatory. *William H. Pickering* . 94
Massachusetts Institute of Technology. *Alfred E. Burton* . 96
Mohler, John Fred 102
Mohler, J. F., and *F. C. Daniel* 361
Princeton Party. *C. A. Young* 77
Seagrave, F. E. 98
Smithsonian Observatory. *C. G. Abbot* 69
U. S. Naval Observatory. *S. J. Brown* 58
Vassar College. *Mary W. Whitney* 96
Very, Frank W. 100
Weather Bureau. 99
Yerkes Observatory. *George E. Hale* 80
Photographs of the Flash Spectrum. *H. C. Lord* . . 13, 149
1901, May 18. Observations of. *C. D. Perrine* . . . 14, 349
The Amherst Expedition to Singkep. *D. P. Todd* . . 14, 362
The Flash Spectrum. *S. A. Mitchell* 15, 97
Photographic Work of Massachusetts Institute of Technology. *Harrison W. Smith* 15, 199
Spectroscopic Results Obtained during. *W. J. Humphreys* . 15, 313
Results Obtained with Photoheliograph at. *G. H. Peters* . 16, 92
1905, August 30. The Crocker Expeditions. *W. W. Campbell* 20, 235
The Kirkwood Observatory Expedition. *John A. Miller* . 23, 93
United States Naval Observatory Expedition. *Colby M. Chester* 23, 128
Observations Made with Selenium Cells. *Th. Wulf* and *J. D. Lucas* 23, 153
Spectrum of Reversing Stratum and of Corona. *C. A. Young* 6, 155
Problems, Solar. *George E. Hale* 11, 47
C. D. Perrine 20, 331
Application of Anomalous Dispersion to Flash Spectrum. *R. W. Wood* 13, 63
Work, Focusing Prismatic and Grating Cameras in. *W. H. Julius* 16, 181
Work, Note on Reflectors for. *W. J. Humphreys* . . . 16, 341
Photometry of Lunar. *F. W. Very* 2, 293
"ECLIPSE Meteorology," Remarks on Bigelow's. *Egon von Oppolzer* 16, 334
Reply to the Foregoing Article. *Frank H. Bigelow* . . 17, 161
EFFICIENCY in Use of Spectrograph, Maximum. *F. L. O. Wadsworth* 3, 321
in Astrophotographic Work, Conditions of Maximum. *F. L. O. Wadsworth* 6, 119; 7, 70

VOLUME AND PAGE

EIFFEL Tower Electric Lights, Spectroscopic Observations of. *A. Cornu* 13, 142
ELECTRIC Arc, Effect of Pressure on Temperature of. *W. E. Wilson* 2, 212
Correction to Foregoing Article. *W. E. Wilson* and *G. F. Fitzgerald* 5, 101
Arc, Studies of. *Henry Crew* 6, 418
Radiation, on the Analysis of. *G. F. Hull* 6, 455
Oven, Emission Spectra of Metals Given by. *A. S. King* . 21, 236
ELECTRICAL Theory of Comets' Tails. *Reginald A. Fessenden* . 3, 36
Fields, Influence of, upon Spectral Lines. *G. F. Hull* . . 25, 1
ELECTROMAGNETIC Nature of Solar Radiation. *H. Ebert* . . 2, 55
Waves, *George W. Mixter* 5, 354
ELEMENTS, See SPECTRUM
EMISSION of Aqueous Vapor and Carbon Dioxide in the Infra-Red Spectrum. *H. Rubens* and *E. Aschkinass* . . . 8, 176
Function, Photometric Method for Determining Exponential Constant of. *F. Paschen* and *H. Wanner* 9, 300
Function, Complete. *P. G. Nutting* 12, 208
ENERGY, Distribution of, in Spectrum of Black Body at High Temperatures. *F. Paschen* 11, 288
ENERGY-CURVE of a Black Body, Maximum in Spectral. *Frank W. Very* 10, 208
ENHANCED Lines of Iron, Titanium, and Nickel. *F. E. Baxandall* . 21, 337
H. M. Reese 19, 322; 22, 222
EQUATION, Personal, in Measuring Photographic Spectra. *B. Hasselberg* 15, 208
EQUIVALENT of the Unit of Light, Mechanical. *Knut Ångström* . 15, 223
δ Equulei, Parallax of Binary System. *William J. Hussey* . . 17, 378
Eros, Witt's Planet (433). *Edward C. Pickering* . . 8, 261; 9, 53, 116
Opposition of, in 1900. *Edward C. Pickering* 11, 244
Positions of, in 1893, 1894, and 1896. *Edward C. Pickering* . 12, 55
and *Pleiades* Plates Taken with Crossley Reflector, Examination of. *J. K. Rees* 13, 48
Variability in Light of. *Edward C. Pickering* . . . 13, 273, 277
Opposition of, in 1903. *Edward C. Pickering* 14, 209
Visibility of. (See also Correction, 17, 163.) *E. C. Pickering*. 16, 336
ERRATA. 4, 310, 374; 5, 278; 6, 58; 7, 214; 8, vii, 263; 9, 189; 11, 169; 14, 215, 295; 15, 69; 17, 163; 18, 235; 19, 84; 23, 180, 24, 369
ERROR of a Radial Velocity-Determination, Probable. *W. W. Campbell* 11, 167
ESCAPE of Gases from Planetary Atmospheres. *S. R. Cook* . . 11, 36
G. Johnstone Stoney . . . 11, 251, 357; 12, 201; 20, 69
ESPIN-BIRMINGHAM 281, Variability of. *T. E. Espin* . . . 1, 351

	VOLUME AND PAGE
ÉTALONS, Rapport sur la nécessité d'établir un nouveau système de longueurs d'onde. *A. Perot* et *Ch. Fabry*	20, 318
EVOLUTION of Solar Stars. *Arthur Schuster*	17, 165
of the Solar System. *F. R. Moulton*	22, 165
of Solar System, Note on. *W. H. Pickering*	22, 354
EXPEDITION for Solar Research. *George E. Hale*	19, 385
to Southern Hemisphere, The D. O. Mills. *W. H. Wright*	20, 140
EXPLANATION, An Apology and an. *F. R. Moulton*	22, 355
EXPOSURE, Effect of Intermittent, on Bromide of Silver Gelatine. *K. Schwarzschild*	11, 92
EXTINCTION, Photographic. *Egon v. Oppolzer*	9, 317
EYE-ESTIMATES of Magnitudes by Method of Sequences, Accuracy of. *Alexander W. Roberts*	4, 184
of Stellar Magnitude. *E. C. Pickering*	4, 305
FACULAE, Drift in Longitude of. *A. L. Cortie*	14, 317
Ultra-Violet Radiation of Sun-Spots and. *K. Schwarzschild* and *W. Villiger*	23, 345
FIELD, Radiation in Magnetic. *A. A. Michelson*	6, 48
Radiation of Mercury in Magnetic. *C. Runge* and *F. Paschen*	16, 118
Separation of Corresponding Series Lines in Magnetic. *C. Runge* and *F. Paschen*	16, 123
FIELDS, Electrical, Influence of, upon Spectral Lines. *G. F. Hull*	25, 1
FIGURE of the Sun, Remarks on C. L. Poor's Papers on. *L. Ambronn*	23, 343
FILMS on Glass, Distortion of Photographic. *Sebastian Albrecht*	25, 349
FILTERS for Astronomical Photography with Reflecting Telescopes, Color. *Robert James Wallace*	24, 268
FLASH, Photograph of Spectrum of. *K. D. Naegamvala*	8, 120
Correction to Foregoing Article. *T. W. Backhouse*	8, 198
Application of Anomalous Dispersion to Spectrum of. *R. W. Wood*	13, 63
Spectrum, May 18, 1901. *S. A. Mitchell*	15, 97
FLOCCULI, Calcium and Hydrogen. *George E. Hale* and *Ferdinand Ellerman*	19, 41
FLOWER Observatory, Latitude Work of. *Charles L. Doolittle*	6, 429
FLUORESCENCE of Sodium and Potassium Vapors, and Its Significance in Astrophysics. *Eilh. Wiedemann* and *G. C. Schmidt*	3, 207
and Afterglow Phenomena in Vacuum Tubes Containing Nitrogen. *Percival Lewis*	12, 8
and Absorption Spectra of Sodium Vapor. (See also Erratum, 18, 235.) *R. W. Wood* and *J. H. Moore*	18, 94
FLUORIDES in Electric Arc, Spectra of Alkaline-Earth. *Ch. Fabry*	21, 356
FLUORINE, Note on Spectrum of. *Joseph Lunt*	22, 256

VOLUME AND PAGE

FLUOR-SPAR, Presence of Yttrium and Ytterbium in. *W. J. Humphreys* 20, 266; 22, 157
FOCUS of an Objective, Determination of. *H. C. Lord* . . . 5, 305
for *Nova Persei*, Change in. *E. E. Barnard* 16, 183
FOCUSING Prismatic and Grating Cameras in Eclipse Work. *W. H. Julius* 16, 181
FOGGY Atmosphere, Radiation through. *Arthur Schuster* . . 21, 1
FORMULA for Prismatic Spectra, Interpolation. *J. Hartmann* . . 8, 218
FRINGES, Photographic Method of Determining Visibility of Interference, in Spectroscopic Measurements. *George E. Hale* . 1, 435
FROST, Edwin Brant, Election of, as Professor of Astrophysics at Yerkes Observatory. *George E. Hale* 8, 59
FUNCTION, Photometric Method for Determining Exponential Constant of Emission. *F. Paschen* and *H. Wanner* . . 9, 300
Complete Emission. *P. G. Nutting* 12, 208
GALLIUM, Wave-Lengths of Principal Lines in Spectrum of. *W. N. Hartley* and *Hugh Ramage* 9, 214
Note on the Foregoing Article. *Lewis E. Jewell* . . . 9, 229
GALVANOMETER for Spectro-Bolometric Purposes, Sensitive. *C. G. Abbot* 18, 1
GAS, Spectrum of Clèveite. *C. Runge* and *F. Paschen* . . . 3, 4
Kinetic Theory of, as Related to the Presence of Helium in the Earth's Atmosphere. *G. Johnstone Stoney* . . . 8, 316
GASEOUS Celestial Bodies, Constitution of. *A. Ritter* . . . 8, 293
GASES Obtained from Uraninite, The New. *J. Norman Lockyer* . 3, 29
in the Earth's Atmosphere, New. *Edwin B. Frost* . . . 8, 121
Escape of, from Planetary Atmospheres According to the Kinetic Theory. *S. R. Cook* 11, 36
G. Johnstone Stoney . . 11, 251, 357; 12, 201; 20, 69
Effect of Impurities on Spectra of. *Percival Lewis* . . 10, 137; 12, 16
Neon, Argon, Krypton, and Xenon in the Chromosphere. *S. A. Mitchell* 17, 224
Spectra of Mixed. *P. G. Nutting* 19, 105
GELATINE, Deviations from Law of Reciprocity for Bromide of Silver. *K. Schwarzschild* 11, 89
Effect of Intermittent Exposure on Bromide of Silver. *K. Schwarzschild* 11, 92
α^1 *Geminorum*, Spectroscopic Binary. *A. Belopolsky* . . . 5, 1
System of *Castor*. *Heber D. Curtis* 23, 351
γ *Geminorum*, Variable Radial Velocity of. *V. M. Slipher* . . 22, 84
ζ *Geminorum*, Motion of, in Line of Sight. *W. W. Campbell* 9, 86; 13, 90
Observations on. *F. P. McDermott, Jr.* 16, 117
Gemini. See also *Nova Geminorum*.

VOLUME AND PAGE

GEOMETRICAL Theory of Optical Imagery. *James P. C. Southall* . 24, 156
GERMANIUM, The Arc-Spectra of the Elements. II. *H. A. Rowland* and *R. R. Tatnall* 1, 149
GIACOBINI'S Comet (1906 I), Photographic Observations of. *E. E. Barnard* 24, 255
GLASS and Silvered Glass Mirrors, Reflecting Powers of. *C. A. Chant* 21, 211
GRAIN in Photography, Silver. *Robert James Wallace* . . . 20, 113
GRANULATION of Surface of the Sun, Cause of. *J. Scheiner* . . 2, 77
GRATING Spectroscopes, Fixed-Arm Concave. *F. L. O. Wadsworth* 2, 370
Use and Mounting of Concave, as an Analyzing or Direct Comparison Spectroscope. *F. L. O. Wadsworth* . . . 3, 47
Concave, for Stellar Photography. *Charles Lane Poor* and *S. Alfred Mitchell* 7, 157
Use of, in Stellar Spectroscopic Work. *F. L. O. Wadsworth* . 7, 198
Notes on the Concave. (See also Correction, **8**, 263.) *S. A. Mitchell* 8, 102
H. C. Plummer 16, 97
Spectroscope, Direct Concave. *S. A. Mitchell* . . . 10, 29
and Prism Spectroscope, Comparison of. *N. Ernest Dorsey* . 12, 164
Concave Rowland, Reversing Layer Photographed with. *J. F. Mohler* and *F. C. Daniel* 12, 361
and Interference Measurements, Discrepancy between. *Louis Bell* 15, 157
Spectra, Effects of Ruling Errors in. *A. S. King* . . . 17, 239
Objective Spectroscope, Measurements of Wave-Lengths with Concave. *F. L. O. Wadsworth* 18, 77
Spectra, Intensity of. *R. W. Wood* 21, 173
Replicas, Diffraction. *Robert James Wallace* . . 22, 123; 23, 96
Mechanical Illustration of Plane. *Herbert M. Reese* . . 24, 47
Spectroscopes, Occulting Shutter for Concave. *Herbert M. Reese* 24, 49
GRATINGS, Focal Singularities of Plane. *S. A. Mitchell* . . . 14, 331
Spectra of Imperfect. *A. A. Michelson* 18, 278
Investigations on Plane Reflection, with Reference to Their Use in the Absolute Determination of Wave-Lengths. *Ernst Giesing* 25, 237
GRAVITATION, Physical Causes of Deviations from Newton's Law of. *Peter Lebedew* 16, 155
Numerical Relation between Light and. *Victor Wellmann* . 15, 282
GROUNDWORK in the Constellation *Taurus*, On a Nebulous. *E. E. Barnard* 25, 218

VOLUME AND PAGE

HARVARD Observatory, Variable Star Work of. *E. C. Pickering* . 6, 418
Observatory, Astronomical and Astrophysical Conference at. *George E. Hale* 8, 54, 193, 229
Photographs of *Nova Persei*, Comments on Early. *E. E. Barnard* 16, 340
College Observatory Circulars. (For titles see under "PICKERING, EDWARD C.," in Author Index.) No. 1, 2, 320; No. 2, 2, 321; No. 3, 3, 77; No. 4, 3, 162; No. 5, 3, 213; No. 6, 3, 296; No. 7, 4, 138; No. 9, 4, 142; No. 10, 4, 234; No. 11, 4, 235; No. 12, 4, 369; No. 13, 4, 370; No. 14, 4, 373; No. 16, 5, 92; No. 17, 5, 350; No. 18, 6, 258; No. 19, 6, 459; No. 20, 6, 461; No. 21, 7, 139; No. 22, 7, 139; No. 23, 7, 141; No. 24, 7, 208; No. 25, 7, 211; No. 26, 7, 306; No. 27, 7, 308; No. 28, 7, 392; No. 29, 8, 55; No. 30, 8, 57; No. 31, 8, 115; No. 32, 8, 116; No. 33, 8, 257; No. 34, 8, 261; No. 35, 9, 51; No. 36, 9, 53; No. 37, 9, 116; No. 38, 9, 173; No. 39, 9, 175; No. 40, 9, 178; No. 41, 9, 179; No. 42, 9, 182; No. 43, 9, 274; No. 44, 10, 126; No. 45, 10, 221; No. 46, 10, 285; No. 47, 11, 165; No. 48, 11, 322; No. 49, 11, 244; No. 50, 11, 416; No. 51, 12, 55; No. 52, 12, 159; No. 53, 13, 167; No. 54, 13, 226; No. 55, 13, 230; No. 56, 13, 170; No. 57, 13, 232; No. 58, 13, 273; No. 59, 14, 79; No. 60, 14, 144; No. 61, 14, 209; No. 62, 14, 367; No. 64, 15, 229; No. 65, 15, 343; No. 66, 16, 336; No. 68, 17, 245; No. 70, 17, 305; No. 71, 18, 70; No. 75, 19, 220; No. 76, 19, 287; No. 78, 19, 289; No. 87, 20, 357; No. 88, 20, 296; No. 92, 21, 292; No. 98, 22, 87; No. 99, 22, 90; No. 106, 22, 271; No. 110, 23, 255; No. 111, 23, 257.
HEAT, Effect of, on Phosphorescence. *F. L. O. Wadsworth* . . 6, 153
Determination of Radiation of, with Pyrheliometer. *Knut Ångström* 9, 332
Radiation of the Stars. *George E. Hale* 9, 360
Radiation of the Corona. *S. P. Langley* 12, 370
Radiation of *Arcturus*, *Vega*, *Jupiter*, and *Saturn*. *E. F. Nichols* 13, 101
Radiation of Long Wave-Length Emitted by Black Bodies. *H. Rubens* and *F. Kurlbaum* 14, 335
Radiation, Pressure Due to. *E. F. Nichols* and *G. F. Hull* . 15, 62
HEAVENS, Diffused Nebulosities in the. *E. E. Barnard* . . . 17, 77
HELIOGRAPHIC Positions. (See also Errata, 7, 214.) *Frank W. Very* 6, 246, 400; 7, 56
HELIOMICROMETER. *George E. Hale* 25, 293
HELIOSTAT, Polar, and Equatorial Telescope Combined. *F. L. O. Wadsworth* 4, 310
Diurnal Rotation of Field of. *M. A. Cornu* 11, 148

	VOLUME AND PAGE
HELIUM, Terrestrial (?) *George E. Hale*	1, 439
in Clèveite. *George E. Hale*	2, 76
Spectrum of. *W. Crookes*	2, 227
C. Runge and *F. Paschen*	3, 4
in β *Lyrae*. *Edwin B. Frost*	2, 383
Lines in Vacuum Tube and D_3 in Sun, Wave-Length of. *J. F. Mohler* and *L. E. Jewell*	3, 351
Spectra of Heavy and Light. *J. S. Ames* and *W. J. Humphreys*	5, 97
Stars, Comparison of Oxygen with Extra Lines in Spectra of. *Frank McClean*	7, 367
Presence of, in Earth's Atmosphere, and Its Relation to the Kinetic Theory of Gas. *G. Johnstone Stoney*	8, 316
HEMISPHERE, The D. O. Mills Expedition to Southern. *W. H. Wright*	20, 140
Note on the D. O. Mills Expedition to Southern. *W. W. Campbell*	23, 269
Z Herculis, On Periodic Changes of Variable Star. *N. C. Dunér*	1, 285; 3, 348
β *Herculis*, Variable Velocity of, in Line of Sight. *W. W. Campbell*	11, 140
M 13 Herculis, Distribution of Stars in Cluster. *H. K. Palmer*	10, 246
Some Abnormal Stars in Cluster. *E. E. Barnard*	12, 176
Variable Star in Cluster. *E. E. Barnard*	12, 182
SV Herculis, New Variable. *Edward C. Pickering*	20, 358
HERSCHEL, Sir John, Magnitudes of 919 Stars Observed by. *W. Doberck*	11, 192, 270
HERSCHEL'S Nebulous Regions. *Isaac Roberts*	17, 72
HOLMES'S Comet, Photographic and Visual Observations of. *E. E. Barnard*	3, 41
HORIZON, Midnight Illumination above Northern, near Time of Summer Solstice. *E. E. Barnard*	24, 128
HUGGINS Method of Photographing the Solar Corona without an Eclipse. *George E. Hale*	2, 77
HYDROCARBON Bands in Spectrum of Bunsen Flame, Effects of Sodium on. *Percival Lewis*	15, 122
HYDRODYNAMICAL Investigations of the Solar Rotation. (See also Correction, 4, 310.) *E. J. Wilczynski*	4, 101
Remarks on the Foregoing Article. (See also Errata, 5, 278). *Paul Harzer*	5, 36
HYDROGEN Lines, Stars Whose Spectra Contain both Bright and Dark. *W. W. Campbell*	2, 177.
Spectrum of. *H. Kayser*	5, 243
Louis A. Parsons	18, 112
New Series in Spectrum of. *J. R. Rydberg*	6, 233

VOLUME AND PAGE

HYDROGEN (*Continued*)
Line, A Variable Bright. *Edward C. Pickering* . . . 7, 139
in Nebulae, Spectrum of. *J. Scheiner* 7, 231
Atmosphere Surrounding Wolf-Rayet Star $DM + 30°3639$. *James E. Keeler* 8, 113
Line $H\delta$, Wave-Length of. *W. H. Wright* 9, 50
Lines, Appearance of Solar Spectrum near, and Wave-Length of $H\delta$. *Lewis E. Jewell* 9, 211
Spectra of *Orion* Nebula and of a Geissler Tube, Comparison of. *W. W. Campbell* 9, 312
Spectrum, Effect of Pressure upon Wave-Lengths of. *J. Wilsing* 10, 269
Spectrum of, Beyond λ 185 $\mu\mu$. *Victor Schumann* . . . 11, 312
Arc Spectra of Metals in Atmosphere of. *Henry Crew* . . 12, 167
Spectrum of, Given by Metallic Arc of Tin, Copper, Silver, etc. *O. H. Basquin* 14, 1
Influence of Atmosphere of, on Arc Spectra of Iron, etc., Compared with That of Ammonia. *Royal A. Porter* . . 15, 274
Wave-Lengths of Certain Lines of Second Spectrum of. *Edwin B. Frost* 16, 100
Flocculi, Calcium and. *George E. Hale* and *Ferdinand Ellerman* 19, 41
Spectrum of, in Region of Extremely Short Wave-Lengths. *Theodore Lyman* 23, 181
On the Radiation of Canal Rays in. *J. Stark* 25, 23, 170
HYPOTHESIS, Attempt to Test Nebular. *F. R. Moulton* . . . 11, 103
ILLUMINATION above Northern Horizon near Time of Summer Solstice, Midnight. *E. E. Barnard* 24, 128
IMAGE, Character of Star, in Spectrographic Work. *J. S. Plaskett* . 25, 195
IMAGERY, Geometrical Theory of Optical. *James P. C. Southall* . 24, 156
IMAGES, Effect of Atmospheric Aberration on Intensity of Atmospheric. *F. L. O. Wadsworth* 7, 70
INCANDESCENT Platinum, Radiation of. *Harry Fielding Reid* . 2, 160
INTENSITIES, Measurement of Photographic. *Edward C. Pickering* . 11, 416
INTENSITY-RATIOS of Principal Lines in Spectra of Several Gaseous Nebulae. *J. Scheiner* and *J. Wilsing* 16, 234
INTERFERENCE Fringes in Spectroscopic Measurements, Photographic Method of Determining Visibility of. *George E. Hale* . 1, 435
Methods, Application of, to Determination of Effective Wave-Length of Starlight. *George C. Comstock* . . . 5, 26
Phenomena, Application of, to Spectroscopy and Metrology. *A. Perot* and *Charles Fabry* 9, 87
Measurements, Discrepancy between Grating and. *Louis Bell* . 15, 157
INTERFEROMETER, New Form of. *Ch. Fabry* and *A. Perot* . . 13, 265
INVERSION, Planetary. *F. J. M. Stratton* 24, 46

VOLUME AND PAGE

Iris (7), Variability of. *Edward C. Pickering* 19, 220
IRON Radiating in Magnetic Field, Asymmetry in Change of Spectral Lines of. *P. Zeeman* 9, 47
Standard Lines in Arc Spectrum of. *H. Kayser* . . . 13, 329
Spark Spectrum of, in Liquids and in Air at High Pressures. *George E. Hale* 15, 132
George E. Hale and *Norton A. Kent* 17, 154
Absolute Wave-Lengths in Spectrum of. *C. Fabry* and *A. Perot* 15, 73, 261
Influence of Atmospheres of Nitrogen and Hydrogen on Arc Spectrum of, Compared with That of Ammonia. *Royal A. Porter* 15, 274
Enhanced Lines of. *Herbert M. Reese* 19, 322; 22, 222
F. E. Baxandall 21, 337
Effect of Pressure of 37 Atmospheres on Certain Lines of Arc Spectrum of. *W. J. Humphreys* 22, 217
Jupiter, Refraction in Atmosphere of. 3, 394
Surface Markings of. *G. W. Hough* 6, 443
Period and Elongation Distance of Fifth Satellite of. *George E. Hale* 9, 358
and *Mars*, Relative Brightness of. *J. Hartmann* . . . 10, 225
Heat Radiation of. *E. F. Nichols* 13, 101
Jupiter's Satellites, Photographic Observations of Eclipses of. *Willard P. Gerrish* 1, 146
Fourth Satellite, Eclipse of, February 19, 1895. *Edward C. Pickering* 1, 309
Satellites, Forms of Disks of. *S. I. Bailey* 2, 97
KALOCSA, Prominences Observed at, on May 28, 1900. *J. Fényi* . 12, 24
KINETIC Theory of Gas. Presence of Helium in the Earth's Atmosphere and Its Relation to. *G. Johnstone Stoney* . . 8, 316
Theory, Escape of Gases According to. *S. R. Cook* . . 11, 36
KIRCHHOFF's Solar Spectrum, Scale of. *J. Hartmann* . . . 9, 69
Law, Present Status of. *A. Cotton* 9, 237
KRYPTON, Spectra of. *C. Runge* 10, 73
in the Chromosphere. *S. A. Mitchell* 17, 224
LANTHANUM, Arc-Spectrum of. *Henry A. Rowland* and *Caleb N. Harrison* 7, 373
LATITUDE Work of the Flower Observatory. *Charles L. Doolittle* . 6, 429
LAW of the Sun's Rotation. *J. Wilsing* 3, 247
LAYER, Reversing, Photographed with a Concave Rowland Grating. *J. F. Mohler* and *F. C. Daniel* 12, 361
LENS for Adapting a Visually Corrected Refracting Telescope to Photographic Observations with the Spectroscope. *James E. Keeler* 1, 101

VOLUME AND PAGE

LENS (*Continued*)
for Visual Telescopes, Photographic Correcting. *James E. Keeler* 1, 350
Celestial Photographs with a "Magic Lantern." *E. E. Barnard* 2, 351
Performance of an Auxiliary, for Spectrographic Investigations with the Thirty-Inch Refractor of the Pulkowa Observatory. *A. Belopolsky* 3, 147
Distortion Due to, in a Projection Drawing. *Frederick Slocum* . 6, 259
Photographic Correcting, of Emerson McMillin Observatory. *H. C. Lord* 6, 87
LENSES, Astronomical Photography with Small. *E. E. Barnard* . 6, 446
LEONIDS. See METEORS
ο *Leonis*, Variable Velocity of, in Line of Sight. *W. W. Campbell* . 8, 291
ε *Leonis*, Variable Velocity of, in Line of Sight. *Walter S. Adams* . 11, 307
Velocity of, in Line of Sight. *W. H. Wright* 11, 414
ε *Librae*, Variable Velocity in Line of Sight of. *W. W. Campbell* . 10, 178
LIBRARY, Loss of, by Fire. *T. J. J. See* 6, 462
LICK OBSERVATORY, A Large Reflector for. *Edward S. Holden* . 1, 442
Physical and Micrometrical Observations of Planet *Venus* Made at. *E. E. Barnard*. 5, 299
New Director of. *George E. Hale* 7, 310
Mills Spectrograph of. (See also Errata, 8, vii.) *W. W. Campbell* 8, 123
Photographs of Comet X, 1898 (Brooks), Made with Crossley Reflector of. *James E. Keeler* 8, 287
Crocker Expedition, Spectrographic Results Obtained at the Indian Eclipse by. *W. W. Campbell* 11, 226
Crossley Reflector of. (See also Correction, 16, 121.) *James E. Keeler* 11, 325
Appointment of Professor W. W. Campbell as Director of. *George E. Hale* 12, 381
Examination of *Pleiades* and *Eros* Plates Taken with Crossley Reflector of. *J. K. Rees* 13, 48
Application of Crossley Reflector of, to Study of Very Faint Spectra. *Harold King Palmer* 18, 218
Loss of Light in 36-Inch Objective of. *J. H. Moore* . . 20, 292
LICK Observatory Bulletins. No. 4, 14, 138; No. 5, 14, 202; No. 6, 14, 261; No. 8, 14, 269; No. 9, 14, 349; No. 10, 14, 359; No. 14, 15, 136; No. 15, 15, 142; No. 18, 15, 147; No. 19, 16, 53; No. 20, 16, 114; No. 23, 16, 249, 257; No. 31, 17, 308, 310; No. 32, 17, 378; No. 33, 17, 310; No. 35, 18, 218; No. 37, 18, 297, 299; No. 41, 18, 341; No. 46, 18, 306; No. 48, 19, 80, 83; No. 52, 19, 121; No. 53, 19, 212; No. 58, 20,

VOLUME AND PAGE

LICK Observatory Bulletins (*Continued*)
224; No. 59, **20**, 235; No. 60, **20**, 140; No. 62, **20**, 149, 231, 232; No. 63, **20**, 285, 292; No. 64, **20**, 354, 356; No. 70, **21**, 176, 185, 191; No. 75, **21**, 371, 376; No. 83, **22**, 138, 274; No. 98, **23**, 261, 263, 269, 351, **24**, 51; No. 105, **24**, 345; No. 106, **24**, 333; No. 107, **25**, 54–59; No. 118, **25**, 330, 349.

LIGHT Curves of Variable Stars Determined Photometrically. *Edward C. Pickering* **3**, 281
Ratio, Method of Determining Value of. *Alexander W. Roberts* **4**, 265
Absorption of, as Determining Factor in Selection of Objective for Great Refractor of Potsdam Observatory. *H. C. Vogel* **5**, 75
Emitted by a Substance, Influence of Magnetism on Nature of. *P. Zeeman* **5**, 332
Influence of Magnetic Field on Radiation of. *H. A. Lorentz* **9**, 37
Curves of Variable Stars of Short Period, Relation between Visual and Photographic. *S. I. Bailey* **10**, 261
Solar Phenomena Considered in Connection with Anomalous Dispersion of. *W. H. Julius* **12**, 185
of Variable Intensity, Diffraction by. *H. M. Reese* . . . **13**, 199
of All the Stars, Total. *Simon Newcomb* **14**, 297
Gavin J. Burns **16**, 166
Experimental Investigation of Pressure of. *Peter Lebedew* . **15**, 60
and Heat Radiation, Pressure Due to. *E. F. Nichols* and *G. F. Hull* **15**, 62
Mechanical Equivalent of Unit of. *Knut Ångström* . . **15**, 223
and Gravitation, Numerical Relation between. *Victor Wellmann* **15**, 282
in Spectrum Analyses, Economizing. *W. J. Humphreys* . . **18**, 324
Pressure, Comet 1903 Borrelly and. *S. A. Mitchell* . . . **20**, 63
Loss of, by Diffraction at a Narrow Slit. *J. H. Moore* . . **20**, 285
Loss of, in the 36-Inch Lick Objective. *J. H. Moore* . . **20**, 292
Action of a Prism on White. *J. S. Ames* **22**, 76
on Sun's Disk, Distribution of Brightness of Ultra-Violet. *K. Schwarzschild* and *W. Villiger* **23**, 284
Variations of Asteroids and Satellites. *Henry Norris Russell* . **24**, 1
of Extremely Short Wave-lengths, Absorption of Some Solids for. *Theodore Lyman* **25**, 45
in Dispersion Bands, Arbitrary Distribution of, and Its Bearing on Spectroscopy and Astrophysics. *W. H. Julius* . . **25**, 95

LIGHTNING, Spectrum of. *Edward C. Pickering* **14**, 367
Philip Fox **18**, 294

LINE Structure. *P. G. Nutting* **23**, 64, 220; **24**, 111

LINE OF SIGHT. See also VELOCITIES and SPECTROSCOPIC BINARIES
Differential Method of Determining Velocity of Stars in. *E. B. Frost* **2**, 235

VOLUME AND PAGE

LINE OF SIGHT (*Continued*)
Relative Motion of Stars in. *Edward C. Pickering* . . . 4, 370
Sources of Error in Investigation on Motion in. *H. C. Vogel* . 7, 249
Stellar Motions in. *H. C. Lord* 8, 65
Reduction to Sun of Observations for Motion in. *Frank Schlesinger* 9, 159
Constants for Principal Stars. *Frank Schlesinger* 10, 1
Constants for Some Stars of the *Orion* Type. *Emily Elisabeth Dobbin* 19, 382
Motion for Determining Parabolic Orbit. *F. R. Moulton* . 10, 14
Determination of Stellar Motions in. *H. C. Vogel* . . . 11, 373
Motion in. *William Huggins* 14, 369
LINES. See also SPECTRA, WAVE-LENGTH, SOLAR and STELLAR SPECTRA
Displacement of, by Rotation of Planet. *James E. Keeler* . 1, 352
Broadening of Spectral. *A. A. Michelson* 2, 251
Wave-Length of Some Helium, and of D_3 in the Sun. *J. F. Mohler* and *L. E. Jewell* 3, 351
New Formula for Wave-Lengths of Spectral. *J. J. Balmer* . 5, 199
Cause for Shift of Spectral. *George F. Fitzgerald* . . . 5, 210
in Spectroheliograph, Method of Correcting Curvature of. *W. H. Wright* 5, 325
Curvature of Spectral. *H. C. Lord* 5, 348
Violet Part of Some Metallic Spectra Which Contain Many. *O. Lohse* 6, 95
Relative Frequency of H and K, in Spectrum of the Chromosphere. *George E. Hale* 6, 157
of β *Aurigae*, The K. *Antonia C. Maury* 8, 173
of Iron Radiating in Magnetic Field, Asymmetry in Change of. *P. Zeeman* 9, 47
Ultra-Violet Coronal. *K. D. Naegamvala* 13, 240
Determination of Wave-Lengths of Brighter Nebular. *W. H. Wright* 16, 53
Wave-Lengths of Certain Oxygen. *Edwin B. Frost* and *Walter S. Adams* 16, 119
in Magnetic Field, Separation of Corresponding Series. *C. Runge* and *F. Paschen* 15, 333; 16, 123
Prolongation of Spectral. *Theodore Lyman* 16, 328
Peculiarities and Changes of, as Consequences of Anomalous Dispersion of Sunlight in Corona. *W. H. Julius* . . 18, 50
λ 4128 and λ 4131, Wave-Lengths of Silicon, and of the Carbon Line λ 4267. *J. Hartmann* 18, 65
Michelson's Theory of Displacement of Spectral. *J. Fényi* . 19, 70

VOLUME AND PAGE

LINES (*Continued*)
of Titanium, Iron, and Nickel, Enhanced. *Herbert M. Reese* 19, 322; 22, 222
F. E. Baxandall . 21, 337
in Air, Conditions Attending Appearance of Argon. *A. S. King* 21, 344
Wave-Lengths of Certain Silicon. *Edwin B. Frost* and *Julius A. Brown* 22, 157
Motion of Calcium Vapor in Sun and the H and K. *Walter S. Adams* 23, 45
in Series, Distribution of Spectral. *T. S. Elston* . . . 23, 346
Structure of the Finest Spectral. *O. von Baeyer* . . . 25, 267
Influence of Electrical Fields upon Spectral. *G. F. Hull* . . 25, 1
LIQUID Surfaces, Steady. (See also Errata, 5, 350.) *D. B. Brace* . 5, 214
LITHIUM, Some Additions to Arc Spectrum of. *F. A. Saunders* . 20, 188
LITTROW Spectroscope, Dr. Pulfrich's Modification of. *J. E. Keeler* 1, 353
LONGUEURS d'onde étalons, Rapport sur la nécessité d'établir un nouveau système de. *A. Perot* et *Ch. Fabry* 20, 318
LONGITUDE Determinations, Personal Equation in. *H. S. Pritchett* . 6, 438
LONGITUDES, Martian. *Percival Lowell* 1, 393
LOWELL Observatory Bulletins . . . No. 11, 20, 146; No. 23, 22, 318
Spectrograph. *V. M. Slipher* 20, 1
Spectrograph, Observations of Standard Velocity Stars in 1905 with. *V. M. Slipher* 22, 318
LUMINESCENCE, Cathodo-, and the Negative-Pole Spectrum of Nitrogen. *Percival Lewis* 17, 258
LUMINESCENCES, Spectra of Weak. *Harry W. Morse* . . 21, 83, 410
LUMINESCENT Metallic Vapors, Spectra of Cathodo-. *Percival Lewis* 16, 31
LUMINOSITY Curve of Solar Spectrum, Method of Determining. *D. W. Murphy* 11, 220
and Total Radiation of Corona, Comparative. *S. P. Langley* . 21, 194
of Brightest Stars. *George C. Comstock* 23, 248
Lupus, New Variable Star in. *M. Fleming* 2, 354
Lyra, Ring Nebula in. *James E. Keeler* 10, 193
β Lyrae, Helium in. *Edwin B. Frost* 2, 383
Spectrum of. *A. Belopolsky* 6, 328
System of. *G. W. Myers* 7, 1
V Lyrae, Variable Star 6871. *J. A. Parkhurst* 18, 33
MAGELLANIC Cloud. *Edward C. Pickering* 6, 459
MAGNESIUM Band at λ 5007. *H. Crew* and *O. H. Basquin* . . 2, 100
Influence of Atmospheres of Nitrogen and Hydrogen on Arc Spectrum of, Compared with That of Ammonia. *Royal A. Porter* 15, 274
Line at λ 4481, Wave-Length of. *Henry Crew* . . . 16, 246

VOLUME AND PAGE

MAGNESIUM (*Continued*)
Line at λ 4481 under Different Laboratory Conditions of Spark Discharge, Modifications of. *Sir William* and *Lady Huggins* 17, 145
Spectrum of. *James Barnes* 21, 74
Spark. *W. W. Strong* 22, 119
MAGNETIC FIELD, Radiation in. *A. A. Michelson* . . 6, 48; 7, 131
Influence of, on the Radiation of Light. *H. A. Lorentz* . . 9, 37
Asymmetry in Change of Spectral Lines of Iron Radiating in. *P Zeeman* 9, 47
Radiation of Mercury in. *C. Runge* and *F. Paschen* 15, 235; 16, 118
Separation of Corresponding Series Lines in. *C. Runge* and *F. Paschen* 15, 333; 16, 123
MAGNETIC Rotation of Plane of Polarization in Interior of an Absorption Band. *P. Zeeman* 16, 106
Disturbances, Solar Origin of Terrestrial. *E. Walter Maunder* 21, 101
MAGNETISM, Influence of, on the Nature of Light Emitted by a Substance. *P. Zeeman* 5, 332
Minimum Sun-Spots and Terrestrial. *A. L. Cortie* . . . 16, 203
Solar Prominences and Terrestrial. *A. L. Cortie* . . . 18, 287
Simultaneous Occurrences in Solar Activity and Terrestrial. *A. Nippoldt* 20, 202
MAGNITUDE, Eye-Estimates of Stellar. *E. C. Pickering* . . . 4, 305
Physical Meaning of Star. *R. de Kövesligethy* . . . 11, 350
MAGNITUDES of Stars, Comparison of Photometric. *E. C. Pickering* 1, 154
Remarks on the Foregoing Article. *G. Müller* and *P. Kempf* 1, 428
Accuracy of Eye-Estimates of, by Method of Sequences. *Alexander W. Roberts* 4, 184
Star, of Father Hagen's Atlas of Variable Stars. *J. G. Hagen* . 6, 441
Photographic. *Edward C. Pickering* 7, 139
of 919 Stars Observed by Sir John Herschel. *W. Doberck* 11, 192, 270
MAP of Entire Sky, Photographic. *Edward C. Pickering* . . 18, 70
MAPS of Metallic Spectra, Photographic. *H. Crew* . . . 2, 318
MAPPING the Solar Corona without an Eclipse, New Method of. *George E. Hale* 1, 318
Mars, Observations of, Made in 1894 with the Melbourne Great Telescope. *R. L. J. Ellery* 1, 47
Cloud-like Spot on Terminator of. *A. E. Douglass* . . 1, 127
Note on Atmospheric Bands in Spectrum of. *William Huggins* 1, 193
Spectrum of. *Lewis E. Jewell* 1, 311; 3, 255
Review of Spectroscopic Observations of. *W. W. Campbell* . 2, 28
Existence of Twilight Arc upon Planet. *Percival Lowell* . . 2, 136

VOLUME AND PAGE

Mars (*Continued*)
Jewell's Observations of Spectrum of. *W. W. Campbell* . . 4, 79
Spectrographic Observations of, in 1896–97. *James E. Keeler* . 5, 328
and *Jupiter*, Relative Brightness of. *J. Hartmann* . . . 10, 225
South Polar Cap of. *E. E. Barnard* 17, 249
MARTIAN Longitudes. *Percival Lowell* 1, 393
MASCARI'S Observations of *Venus* 3, 226
MASSACHUSETTS Institute of Technology, Photographic Work of Eclipse Expedition from. *Harrison W. Smith* . . . 15, 199
McMILLIN OBSERVATORY, Spectroscope of. *H. C. Lord* . . 4, 50
Photographic Correcting Lens of. *H. C. Lord* . . . 6, 87
Stellar Spectrographic Work of. *H. C. Lord* 6, 424
Observations on Stellar Motions in Line of Sight, Made at. *H. C. Lord* 8, 65
Observations of Radial Velocities of Thirty-One Stars Made at the Emerson. *H. C. Lord* 21, 297
MEASUREMENT of Spectrograms, New Objective Method for. *Karl Kostersitz* 16, 262
MEASUREMENTS, Discrepancy between Grating and Interference. *Louis Bell* 15, 157
MELBOURNE Great Telescope, Observations of *Mars*, Made in 1894 with. *R. L. J. Ellery* 1, 47
MERCURY, Spectra of. *William B. Huff* 12, 103
Compound Triplets in Line Spectrum of. *C. Runge* and *F. Paschen* 14, 49
Radiation of, in Magnetic Field. *C. Runge* and *F. Paschen* 15, 235; 16, 118
Mercury, Proposal for Photometric Observation of, during Eclipse of May 28, 1900. *G. Müller* 11, 144
Inferior Conjunction of, on November 4, 1901. *F. Ristenpart* . 14, 213
Messier 5, Periods of Variable Stars in Cluster. *S. I. Bailey* . . 10, 255
Messier 13, Distribution of Stars in Cluster. *H. K. Palmer* . . 10, 246
METALLIC Spectra, Photographic Maps of. *H. Crew* . . . 2, 318
Poles in Water, Spark Discharge from. *Sir Norman Lockyer* . 15, 190
METALLOIDS, Effect of Self-Induction upon Spark-Spectra of. *Henry Crew* 16, 59
METALS, Arc-Spectra of. *B. Hasselberg*
II. Spectrum of Titanium 4, 116, 212
III. Spectrum of Cobalt and Nickel . . 4, 288, 343; 5, 38
V. Spectrum of Vanadium 10, 343; 11, 67
VI. Spectrum of Molybdenum 16, 300; 17, 20
Arc-Spectra of Some, as Influenced by an Atmosphere of Hydrogen. *Henry Crew* 12, 167
Some Additions to Arc Spectra of Alkali. *F. A. Saunders* . 20, 188

VOLUME AND PAGE

METALS (*Continued*)
Some Emission Spectra of, as Given by an Electric Oven. *A. S. King* 21, 236
See also SPECTRUM
METEORIC Constitution of *Saturn's* Rings, Spectroscopic Proof of. *James E. Keeler* 1, 416; 2, 163
METEORITES, Spectrographic Analysis of. *W. N. Hartley* and *Hugh Ramage* 9, 221
Note on the Foregoing Article. *Lewis E. Jewell* 9, 229
Possible Function of Disruptive Approach in Formation of. *T. C. Chamberlin* 14, 17
METEOROLOGY, Remarks on Bigelow's Eclipse. *Egon von Oppolzer* 16, 334
Reply to the Foregoing Article. *Frank H. Bigelow* . . 17, 161
METEOR, Spectrum of a. *Edward C. Pickering* 6, 461
METEORS, Observations in 1898 of Leonid. *George C. Comstock* . 9, 15
G. W. Myers . . 9, 23
W. L. Elkin . . 9, 20; 10, 25
Edward C. Pickering 8, 115; 9, 51
E. E. Barnard . . 9, 151
Velocity of. *Geo. Fras. Fitzgerald* 9, 50
W. L. Elkin 12, 4
Photographing. *Edward C. Pickering* 9, 178
Josef Jan Frič 10, 130
Perturbations of Leonid. *G. Johnstone Stoney* and *A. M. W. Downing* 9, 203
of 1898, Photographic Observations of. *W. L. Elkin* . . 10, 25
of November, 1899. *Edward C. Pickering* 10, 221
METHODS, A Contribution to Knowledge of Spectroscopic. *H. Konen* 17, 81
METROLOGY, Application of Interference Phenomena to. *A. Perot* and *Charles Fabry* 9, 87
MICHELSON Echelon Spectroscope, Observations on Resolving Power of. *P. Zeeman* 15, 218
MICHELSON'S Theory of Displacement of Spectral Lines. *J. Fényi* . 19, 70
MILKY WAY, Photographs of. *E. E. Barnard* 1, 10
in *Aquila* and *Cygnus*, Distribution of Stars and Distance of. *C. Easton* 1, 216
near *15 Monocerotis* and near *e Cygni*, Photographs of. *E. E. Barnard* 2, 58
near *Theta Ophiuchi*, Photograph of. *E. E. Barnard* . . 9, 157
Position of Stars of Type IV and Variable Stars of Type III in Reference to. *T. E. Espin* 10, 169
New Theory of. *C. Easton* 12, 136
Remarks on the Foregoing Article. *H. Seeliger* 12, 376

VOLUME AND PAGE

MILLS Expedition to Southern Hemisphere. *W. H. Wright* . . 20, 140
Expedition to Southern Hemisphere, Note on. *W. W. Campbell* 23, 269
MILLS SPECTROGRAPH of the Lick Observatory. (See also Errata, 8, vii). *W. W. Campbell* 8, 123
Temperature Control of. *W. W. Campbell* 11, 259
Comparison Spectrum Apparatus of. *W. H. Wright* . . 12, 274
Some Recent Results with. *W. W. Campbell* 14, 138
Mira Ceti, Spectrum of. *W. W. Campbell* 9, 31
Joel Stebbins 18, 341
V. M. Slipher 25, 66, 235
MIRROR for Reflecting Telescopes, Possible Form of. *Charles Lane Poor* 6, 440
Parabolic. *C. W. Crockett* 7, 362
for Mt. Wilson Solar Observatory, 100-Inch. *George E. Hale* . 24, 214
MIRRORS, Aberration of Parabolic. *Charles Lane Poor* . . . 7, 114
Figuring and Use of Eccentric and Unsymmetrical Forms of Parabolic. *F. L. O. Wadsworth* 7, 146
Methods of Testing Optical, during Construction. *G. W. Ritchey* 19, 53
Reflecting Powers of Glass and Silvered Glass. *C. A. Chant* . 21, 211
Mizar, The Spectroscopic Binary. *H. C. Vogel* 13, 324
MISCELLANEOUS Results. *Edward C. Pickering* 16, 336
MOLYBDENUM, Spectrum of. Researches on Arc-Spectra of the Metals. VI. *B. Hasselberg* 16, 300; 17, 20
15 Monocerotis, Photographs of Milky Way near. *E. E. Barnard* . 2, 58
MOON, Photographic Search for Satellite to. *E. E. Barnard* . . 2, 347
Photometry of Eclipse of. *F. W. Very* 2, 293
Photographic Studies of, at the Paris Observatory. *James E. Keeler* 5, 51
Probable Range of Temperature on. *Frank W. Very* . 8, 199, 265
Temperature of. (See also Errata, 26, 382.) *Frank W. Very* . 24, 351
MOON'S Theoretical Spectrographic Velocity. *W. W. Campbell* . 11, 141
Spectrographic Velocity near Full Moon, On Computation of. *R. H. Curtiss* 21, 376
MOTION of Solar System, Preliminary Determination of. *W. W. Campbell* 13, 80
of Stars, Spectra and Proper. *W. H. S. Monck* . . . 8, 28
MOTIONS of Stars, Proper. *Gavin J. Burns* 17, 63
MOTORS for Constant Speed, Design of Electric. *F. L. O. Wadsworth* 1, 169
MOULTON, Professor F. R., Reply to. *W. H. Pickering* . . 22, 357
MOUNT ETNA Observatory, On Some Attempts to Photograph the Corona without an Eclipse, Made at. *A. Riccò* . . 1, 18

VOLUME AND PAGE

MOUNT WILSON. See also SOLAR OBSERVATORY
Study of Conditions for Solar Research at. *George E. Hale* . 21, 124
Solar Observatory, Contributions from. (For titles see under HALE, GEORGE E., and ADAMS, WALTER S., in Author Index.) No. 1, 21, 124; No. 2, 21, 151; No. 3, 23, 1; No. 4, 23, 6; No. 5, 23, 11; No. 6, 23, 45; No. 7, 23, 54; No. 8, 23, 400; No. 9, 24, 129; No. 10, 24, 61; No. 11, 24, 185; No. 12, 24, 69; No. 13, 24, 214; No. 14, 25, 68; No. 15, 25, 75; No. 16, 25, 293; No. 17, 25, 300; No. 18, 25, 311.
MOUNTING for Reflecting Telescopes Devised by Arthur Cowper Ranyard. *F. L. O. Wadsworth* 5, 132
for Reflecting Telescopes, The Ranyard. *George E. Hale* . 5, 148
NAVAL OBSERVATORY, Recommendations of Board of Visitors to 10, 292
Eclipse Expedition in 1905. *Colby M. Chester*. 23, 128
NEBULA. See also *Andromeda*, *Nova Persei*, and *Orion*
Visible Spectrum of Trifid. *W. W. Campbell* 2, 161
near *42 Orionis* Made at Catania, Photograph of. *A. Riccò* . 2, 164
N.G.C. 1499, near the Star *ξ Persei*, Photograph of. *E. E. Barnard* 2, 350
in *Lyra*, Ring. *James E. Keeler* 10, 193
H. IV 13 in *Cygnus*, Annular. *James E. Keeler* . . . 10, 266
H. I 55 Pegasi, Spiral. *James E. Keeler* 11, 1
Density of Solar. *Anne Sewell Young* 13, 338
near *π* and *δ Scorpii*, Great Photographic. *E. E. Barnard* . 23, 144
NEBULAE, Theory of Spiral and Planetary. *E. J. Wilczynski* . . 4, 97
Remarks on the Foregoing Article. (See also Errata, 5, 278.) *Paul Harzer* 5, 36
Spectrum of Hydrogen in. *J. Scheiner* 7, 231
Name Suggested for Principal Constituent of. *Margaret L. Huggins* 8, 54
and Nebulous Stars, New. *Edward C. Pickering* . . . 9, 173
Possible Function of Disruptive Approach in Formation of. *T. C. Chamberlin* 14, 17
Focal Observations on Planetary. (See Erratum, 14, 295.) *E. E. Barnard* 14, 151
Spectrographic Measures of Velocities of Gaseous. *J. Hartmann* 15, 287
in the Vicinity of *Nova Persei*. (See also Errata, 17, 163.) *H. Seeliger* 16, 187; 20, 105
Intensity-Ratios of Principal Lines in Spectra of Several Gaseous. *J. Scheiner* and *J. Wilsing* 16, 234
and Star Clusters, Note Concerning Publication of Crossley Reflector Photographs of. *W. W. Campbell* . . . 20, 295
Number of. *C. D. Perrine* 20, 356

	VOLUME AND PAGE
NEBULAR Hypothesis, Attempt to Test the. *F. R. Moulton*	11, 103
Lines, Wave-Lengths of Brighter. *W. H. Wright*	16, 53
NEBULOSITIES in the Heavens, Diffused. *E. E. Barnard*	17, 77
NEBULOUS Stars, New. *Edward C. Pickering*	9, 173
Regions, Herschel's. *Isaac Roberts*	17, 72
Groundwork in the Constellation *Taurus*. *E. E. Barnard*	25, 218
NEON in the Chromosphere. *S. A. Mitchell*	17, 224
NEWALL, Form of Spectroheliograph Suggested by. *George E. Hale*	5, 211
NICKEL, Arc-Spectra of. *B. Hasselberg*	4, 288, 343; 5, 38
Enhanced Lines of. *Herbert M. Reese*	19, 322
F. E. Baxandall	21, 337
Enhanced Series of. *Herbert M. Reese*	22, 222
NITROGEN, Fluorescence and Afterglow Phenomena in Vacuum Tubes Containing. *Percival Lewis*	12, 8
and Hydrogen, Influence of Atmospheres of, on Arc Spectra of Iron, Zinc, Magnesium, and Tin, Compared with That of Ammonia. *Royal A. Porter*	15, 274
Bands vs. "New Heads to Cyanogen Bands" in Arc Spectra. *Percival Lewis* and *A. S. King*	16, 162
Negative-Pole Spectrum of, and Cathodo-Luminescence. *Percival Lewis*	17, 258
Afterglow of Metallic Vapors in. *Percival Lewis*	20, 49
and Its Oxides, Spectra of. *Percival Lewis*	20, 58
Nova Aquilae. *Edward C. Pickering*	12, 52
Visible Spectrum of. *W. W. Campbell*	12, 258
[No. 2] of 1905. *J. A. Parkhurst*	22, 266
Edward C. Pickering	22, 271
E. E. Barnard	22, 358
No. 2. Spectrum of. *J. H. Moore*	23, 261
Nova Aurigae, Recent Changes in Spectrum of. *W. W. Campbell*	1, 49
Campbell's Observations of. *E. E. Barnard*	5, 277
Nova Carinae. *Edward C. Pickering*	2, 320
Nova Centauri. *Edward C. Pickering*	3, 162, 214
Nova T Coronae of 1866. *E. E. Barnard*	25, 279
Nova Geminorum. *George E. Hale*	17, 300
before Its Discovery. *Edward C. Pickering*	17, 305
An Early Photograph and Photometric Magnitudes of. *J. A. Parkhurst*	17, 373
Observations of. *E. E. Barnard*	17, 376
Photographic Spectrum of. *C. D. Perrine*	18, 297
Spectrum of. *H. M. Reese* and *H. D. Curtis*	18, 299
Visual Observations of. *H. D. Curtis*	19, 83
Nova RS Ophiuchi. *Edward C. Pickering*	22, 90

VOLUME AND PAGE

Nova Persei [No. 2].
Anderson's New Star in *Perseus*. *Edward C. Pickering* . . 13, 170
The New Star in *Perseus*. *George E. Hale* 13, 173
Spectrum of. *H. C. Vogel* 13, 217
No. 2. *Edward C. Pickering* 13, 232
Explosion Theory of. *William H. Pickering* 13, 277
Second Chart and Catalogue for Observing. *John G. Hagen* . 13, 233
Changes in Spectrum of. *George E. Hale* 13, 238
February 28 to April 4. *Walter Sidgreaves* 13, 278
Brightness of. *George C. Comstock* and *Joel Stebbins* . . 13, 336
Spectrum of. *Edward C. Pickering* 14, 79, 82
Visual Observations of. (See Erratum, 14, 295.) *E. E. Barnard* 14, 151
Earlier Spectrum of. *Walter S. Adams* 14, 158
Nebulosity about. *G. W. Ritchey* 14, 167
Observations of Spectrum of. *W. W. Campbell* and *W. H. Wright* 14, 269
Note on the Spectrum of. *Joel Stebbins* 14, 292
Changes in Nebulosity about. *G. W. Ritchey* 14, 293
Motion in Nebula Surrounding. *C. D. Perrine* . . . 14, 359
Spectrum of. *W. Sidgreaves* 14, 366
Explosion Hypothesis in Light of Recent Phenomena of. *W. H. Pickering* 15, 68
Later Photographs of the Nebulosity about. *G. W. Ritchey* . 15, 129
Further Observations of Movements and Changes in Nebulosity about. *C. D. Perrine* 15, 136
Nebula Surrounding. *Louis Bell* 16, 38
Change in Focus for. *E. E. Barnard* 16, 183
Nebulae in the Vicinity of. (See also Errata, 17, 163.) *H. Seeliger* 16, 187; 20, 105
Movements in Nebula Surrounding. *Arthur R. Hinks* . . 16, 198
Photographs and Measures of Nebula Surrounding. *C. D. Perrine* 16, 249
Observations of Nebulosity about, for Polarization Effects. *C. D. Perrine* 16, 257
Early Observations of. *Edward C. Pickering* 16, 338
Comments on Early Harvard Photographs of. *E. E. Barnard* . 16, 340
Spectrum of Nebulosity Surrounding. *C. D. Perrine* . . 17, 310
A Phenomenon Involved in the Nebulosity Around. *Otto Luyties* 19, 129
Parallax of. *Frank W. Very* 20, 79
Dispersion Bands in Spectrum of. *W. H. Julius* . . . 21, 286
Nova Sagittarii. *Edward C. Pickering* 9, 182, 269
Spectrum of. *W. W. Campbell* 9, 308
Position of. *Edward C. Pickering* 10, 285

	VOLUME AND PAGE
Novae, Interpretation of Spectrum of. J. Wilsing	10, 113
Spectrographic Observations of, with Crossley Reflector. *C. D. Perrine*	19, 80
New Nebulous Stars. *Edward C. Pickering*	9, 173
OBITUARY NOTICES	
Abbé, Ernst. *Edwin B. Frost*	21, 379
Bausch & Lomb Optical Co.	23, 350
Brace, DeWitt Bristol. *W. F. Magie*	22, 343
Bruce, Catherine Wolfe. *George E. Hale*	11, 168
Bunsen, Robert Wilhelm. *Henry Crew*	10, 301
Clark, Alvan Graham. *O. C. Wendell*	6, 136
George E. Hale	6, 136
Clerke, Agnes Mary. *Margaret Lindsay Huggins*	25, 226
Cornu, Marie-Alfred. *J. S. Ames*	15, 299
Fizeau, Armand. *Charles S. Hastings*	4, 367
Gould, Benjamin Apthorp	5, 50
Hilger, Adam. *F. L. O. Wadsworth*	6, 139
Krueger, Carl	4, 80
Keeler, James Edward. *George E. Hale*	12, 102
W. W. Campbell	12, 239
Langley, Samuel Pierpont. *C. G. Abbot*	23, 271
Newton, Hubert A.	4, 237
Nobile, Arminio	6, 139
Ranyard, Arthur Cowper. *George E. Hale*	1, 168
Rayet, Georges. *Edwin B. Frost*	25, 53
Rogers, William A. *G. F. Hull*	7, 390
Rowland, Henry Augustus. *Joseph S. Ames*	13, 241
Spörer, Friedrich Wilhelm Gustav. *H. C. Vogel*	2, 239
Stone, Edward James	6, 138
Tacchini, Pietro. *A. Riccò*	22, 1
Thalén, Tobias Robert. *N. C. Dunér*	22, 341
Tisserand, Francois Felix	4, 368
Trouvelot, Étienne-Léopold. *George E. Hale*	2, 166
Wislicenus, Walter F. *Edwin B. Frost*	22, 345
OBJECTIVE Prism, A New Form of. *F. L. O. Wadsworth*	1, 232
Prisms, Determination of Radial Motions by. *E. C. Pickering*	23, 255
Determination of Focus of. *H. C. Lord*	5, 305
OBJECTIVE-PRISM Comparison Spectrograph. *De Lisle Stewart*	23, 396
OCCULTATION of *26 Arietis* Observed Photographically. *Edward C. Pickering*	7, 306
OILS, Use of Cylinder, for Reflecting Surfaces. *Samuel V. Hoffman*	3, 293
Ophiuchi, Photograph of Milky Way near *Theta*. *E. E. Barnard*	9, 157
RS Ophiuchi, A Probable New Star. *Edward C. Pickering*	22, 90

VOLUME AND PAGE

Y Ophiuchi and *T Vulpeculae*, A Spectrographic Study of the Fourth Class Variable Stars. *Sebastian Albrecht* 25, 330
OPTICAL Mirrors, Methods of Testing, during Construction. *G. W. Ritchey* 19, 53
Power of the Atmosphere and Its Measurement. *Karl Exner* and *W. Villiger* 21, 368
Imagery, Geometrical Theory of. *James P. C. Southall* . . 24, 156
OPTICS of the Spectroscope. *Arthur Schuster* 21, 197
ORBIT of η *Aquilae*. (See also Errata, 9, 189.) *W. H. Wright* . 9, 59
Determination of Elements of Parabolic, from Two Observations of Apparent Position, and One of Motion in Line of Sight. *F. R. Moulton* 10, 14
of Spectroscopic Binary χ *Draconis*. *W. H. Wright*. . . 11, 131
of a Spectroscopic Binary, Improved Method of Calculating. *Henry Norris Russell* 15, 252
of Spectroscopic Binary ι *Pegasi*. *Heber D. Curtis* . . . 19, 212
of δ *Orionis*, Spectrum and. *J. Hartmann* 19, 268
of Spectroscopic Binary ζ *Tauri*. *Walter S. Adams* . . . 22, 115
of Spectroscopic Binary, κ *Cancri*. (See also Errata, 26, 382.) *Naozo Ichinohe* 25, 315
of Spectroscopic Binary β *Arietis*. (See also Errata, 26, 382.) *H. Ludendorff* 25, 320
ORBITS of *Algol* Variables *RR Puppis* and *V Puppis*. *Alexander W. Roberts* 13, 177
Orion Type Stars Whose Radial Velocities Vary, Additional. *Edwin B. Frost* and *Walter S. Adams* 17, 246
Type, Line of Sight Constants for Some Stars of. *Emily Elisabeth Dobbin* 19, 382
Variable Stars in. *Edward C. Pickering*. 19, 289
Variable Stars in, in Connection with Chart for *T Orionis*. *John G. Hagen* 19, 344
Orion NEBULA, Variations in Spectrum of. *W. W. Campbell* . . 6, 363
J. M. Schaeberle . . 6, 364
R. G. Aitken . . 6, 365
W. H. Wright . . 6, 365
Campbell's Observations of Variations in Intensities of Lines in. *J. Scheiner* 7, 295
Relative Intensities of Lines in Spectrum of. *C. Runge* . . 8, 32
Spectrum of, and the Purkinje Phenomenon. *W. W. Campbell* . 8, 317
Photographs of, Taken with the Less Refrangible Rays of Its Spectrum. *James E. Keeler* 9, 133
Comparison of Hydrogen Spectra of, and of a Geissler Tube. *W. W. Campbell* 9, 312

VOLUME AND PAGE

Orion NEBULA (*Continued*)
Keeler's Photometric Researches on. *J. Scheiner* . . . 10, 164
Note on the Foregoing Article. *James E. Keeler* . . . 10, 167
Radial Velocity of. *H. C. Vogel* 15, 302
Edwin B. Frost and *Walter S. Adams* . 19, 350
Faint Stars near Trapezium in. *J. A. Parkhurst* . . . 20, 136
Monochromatic Photographs of. *J. Hartmann* . . . 21, 389
α *Orionis*, Spectrograms of. *Henry Harrer* 10, 290
β *Orionis*, Radial Velocity of. *W. W. Campbell* and *Heber D. Curtis* 21, 191
δ *Orionis*, Spectrum and Orbit of. *J. Hartmann* . . . 19, 268
Dispersion Bands in Spectrum of. *W. H. Julius* . . . 21, 286
η *Orionis*, Orbit of the Spectroscopic Binary. (See also Errata, 17, 163.) *Walter S. Adams* 17, 68
T Orionis, Variable Stars in Nebula of *Orion* in Connection with Chart for. *John G. Hagen* 19, 344
The Atlas Chart for, Extended. *J. G. Hagen* 20, 351
42 Orionis, Photograph of Nebula near, Made at Catania. *A. Riccò* 2, 164
ORTHOCHROMATIC Plates. *Robert James Wallace* . . 22, 153, 350
OSMIUM and Platinum, Arc-Spectra of. *H. A. Rowland* and *R. R. Tatnall* 2, 184
OVEN, Some Emission Spectra of Metals as Given by an Electric. *A. S. King* 21, 236
OXYGEN in the Sun. *C. Runge* and *F. Paschen* 4, 317
L. E. Jewell 5, 99; 6, 456
Arthur Schuster 5, 162
C. Runge 6, 426
Comparison of, with Extra Lines in Spectra of Helium Stars. *Frank McClean* 7, 367
Series Spectra of. *C. Runge* and *F. Paschen* 8, 70
in Certain Stars. (See also Errata, 11, 169.) *David Gill* . 10, 272
Lines, Wave-Lengths of. *Edwin B. Frost* and *Walter S. Adams* 16, 119
Absorption Bands of Solar Spectrum. *O. C. Lester* . . . 20, 81
Remarks on the Foregoing Article. *George Higgs* . . . 22, 346
PALLADIUM, Arc Spectrum of. *H. A. Rowland* and *R. R. Tatnall* . 3, 286
H. Kayser 7, 93
PARABOLIC Cylinder, Caustic of the Right. *C. W. Crockett* . . 7, 358
Mirror. *C. W. Crockett* 7, 362
PARALLAX of the *Andromeda* Nebula. *George E. Hale* . . . 9, 184
Determination of, by Means of Photography. *Frank Schlesinger* 10, 242
of Binary System δ *Equulei*. *William J. Hussey* . . . 17, 378
of *Nova Persei*. *Frank W. Very* 20, 79
Plates Taken with the Yerkes Telescope. *Frank Schlesinger* . 20, 123
PARIS Observatory, Photographic Studies of Moon at. *J. E. Keeler* . 5, 51

VOLUME AND PAGE

PASCHEN'S Laws of Radiation. *F. W. Very* 2, 316
V Pegasi, New Variable Star. *M. Fleming* 2, 354
U Pegasi, Variable Star. *Edward C. Pickering* 7, 141
G. W. Myers 8, 163
η *Pegasi* in Line of Sight, Variable Velocity of. *W. W. Campbell* . 8, 159
Spectroscopic Binary. *W. W. Campbell* 14, 202
Orbit of Spectroscopic Binary. *Russell Tracy Crawford* . . 14, 203
H. I 55 Pegasi, The Spiral Nebula. *James E. Keeler* . . . 11, 1
ι *Pegasi*, Variable Velocity of, in Line of Sight. *W. W. Campbell* . 9, 310
Orbit of Spectroscopic Binary. *Heber D. Curtis* . . . 19, 212
85 Pegasi, Mass of. *George C. Comstock* 17, 220
PEROT-FABRY Corrections of Rowland's Wave-Lengths. *Louis Bell* 18, 191
ξ *Persei*, Photograph of Nebula *N.G.C.* 1499, near Star. *E. E. Barnard* 2, 350
α *Persei*, Motion of, in Line of Sight. *H. C. Vogel* . . . 13, 320
o *Persei*, Spectroscopic Binary. *H. C. Vogel* 17, 212
Perseus. See also *Nova Persei*
PERSONAL Equation in Longitude Determinations. *H. S. Pritchett* . 6, 438
PERTURBATIONS of the Leonids. *G. Johnstone Stoney* and *A. M. W. Downing* 9, 203
PHENANTHRENE and Anthracene Vapors, The Fluorescent and Absorption Spectra of. *T. Sidney Elston* 25, 155
PHOSPHORESCENCE, Effect of Heat on. *F. L. O. Wadsworth* . . 6, 153
PHOSPHORESCENT Barium Sulphide, Preparation of. *F. L. O. Wadsworth* 4, 308
PHOTOCHRONOGRAPH. *John T. Hedrick* 6, 435
PHOTOGRAPHIC Extinction. *Egon v. Oppolzer* 9, 317
Notes. *Lewis E. Jewell* 11, 240
Intensities, Measurement of. *Edward C. Pickering* . . 11, 416
Plates, The Daylight Sensitometry of, and a Suggested Standard Dispersion-Piece. Studies in Sensitometry. I. *Robert James Wallace* 25, 116
Films on Glass, Distortion of. *Sebastian Albrecht* . . . 25, 349
PHOTOGRAPHS of the Milky Way. *E. E. Barnard* 1, 10
Celestial, with a Magic Lantern Lens. *E. E. Barnard* . . 2, 351
PHOTOGRAPHY of the Sun, Conditions Which Affect the Spectro-. *A. A. Michelson* 1, 1
Color-, Review of Recent Papers on. *N. E. Dorsey* . . 5, 291
with Small Lenses, Astronomical. *E. E. Barnard* . . . 6, 446
Concave Grating for Stellar. *Charles Lane Poor* and *S. Alfred Mitchell* 7, 157
Celestial, with 40-Inch Visual Telescope. *G. W. Ritchey* . . 12, 352
The Silver "Grain" in. *Robert James Wallace* . . . 20, 113

VOLUME AND PAGE

PHOTOGRAPHY (*Continued*)
with Reflecting Telescopes, Color Filters for. *Robert James Wallace* 24, 268
PHOTOMETER, A New Form of Stellar. *Edward C. Pickering* . . 2, 89
Measurements of *Mars* and *Jupiter* with a New. *J. Hartmann*. 10, 225
Determination of Wedge Constant of Stellar. *J. A. Parkhurst* . 13, 249
Calibration of Wedge. *James D. Maddrill* 22, 138
PHOTOMETERS, Polarizing. *Edward C. Pickering* 7, 211
PHOTOMETRIC Magnitudes of Stars, Comparison of. *Edward C. Pickering* 1, 154
Remarks on the Foregoing Article. *G. Müller* and *P. Kempf* . 1, 428
Studies, Spectral. *D. W. Murphy* 6, 1
Units, Provisional List of. *Henry Crew* 7, 298
Researches on *Orion* Nebula, Keeler's. *J. Scheiner*. . . . 10, 164
Note on the Foregoing Article. *James E. Keeler* 10, 167
Work, New System for Spectral. *D. B. Brace* 11, 6
Measurements, Calibration of Slit in Spectral. *E. V. Capps* . 11, 25
Observation of *Mercury* during Eclipse of 1900, Proposal for. *G. Müller* 11, 144
Adjustments, Spectro-. *L. B. Tuckerman* 16, 145
PHOTOMETRY of a Lunar Eclipse. *F. W. Very* 2, 293
of Short-Period Variable Stars, Photographic. *J. A. Parkhurst* and *F. C. Jordan* 23, 79
PHOTOSPHERE, Origin of Double Lines in Spectrum of Chromosphere Due to Anomalous Dispersion of Light from. *W. H. Julius* 15, 28
PHYSICO-CHEMICAL Processes, Ultra-Violet Absorption Spectra in Relation to. *E. C. C. Baly* and *C. H. Desch* 23, 110
PICKERING, New Form of Photographic Telescope Proposed by Professor. *James E. Keeler* 9, 269
η *Piscium*, Radial Velocity of. *W. W. Campbell* and *Heber D. Curtis* 21, 191
PLANE Gratings, Focal Singularities of. *S. A. Mitchell* . . . 14, 331
PLANET, On Determining Extent of Atmosphere of a. *W. W. Campbell* 1, 85
Displacement of Spectral Lines Caused by Rotation of. *James E. Keeler* 1, 352
Lines of Water Vapor in Spectrum of. *James E. Keeler* . . 4, 137
(344), *Chicago*. *Kurt Laves* 6, 450
Witt's (433) D Q. *Edward C. Pickering* . . . 8, 261; 9, 53
Photographic Search for Intermercurial. *Edward C. Pickering* . 11, 322
PLANETARY Atmospheres. See Atmospheres
Inversion. *F. J. M. Stratton* 24, 46
PLANETS, Recent Researches on Spectra of. *H. C. Vogel* . . 1, 196, 273
PLATE, Number of Stars upon a Photographic. *Egon von Oppolzer* . 16, 332

VOLUME AND PAGE

PLATES Sensitive to Ultra-Violet Rays, Method of Preparing. *Victor Schumann* 3, 220, 387; 4, 144
Orthochromatic. *Robert James Wallace* 22, 153, 350
PLATINUM, Radiation of Incandescent. *Harry Fielding Reid* . . 2, 160
and Osmium, Arc-Spectra of. *H. A. Rowland* and *R. R. Tatnall* 2, 184
Group, Arc-Spectra of Elements of. *H. Kayser* 7, 93, 173
Pleiades and *Eros* Plates Taken with Crossley Reflector, Examination of. *J. K. Rees* 13, 48
Radial Velocities of Brighter Stars in. *Walter S. Adams* . . 19, 338
Polaris, Variable Velocity of. *W. W. Campbell* 10, 180
Edwin B. Frost 10, 184
Motion of, in Line of Sight. *J. Hartmann* 14, 52
Radial Velocity of. *W. W. Campbell* and *Heber D. Curtis* . 21, 191
W. W. Campbell 25, 59
POLARIZATION, Magnetic Rotation of Plane of, in Interior of an Absorption Band. *P. Zeeman* 16, 106
Effects, Observations of Nebulosity about *Nova Persei* for. *C. D. Perrine* 16, 257
and Selective Reflection in the Infra-Red Spectrum. *A. H. Pfund* 24, 19
in Canal Rays, Doppler Effects and. *G. F. Hull* 25, 234
POTASSIUM and Sodium Vapors, Fluorescence of. *Eilh. Wiedemann* and *G. C. Schmidt* 3, 207
Spectrum of. *Hugh Ramage* 16, 43
Some Additions to Arc-Spectrum of. *F. A. Saunders* . . 20, 188
POTSDAM OBSERVATORY, Large Telescope for 3, 395
Absorption of Light as Determining Factor in Selection of Size of Objective for Great Refractor of. *H. C. Vogel*. . . 5, 75
Great Refractor of 11, 100
Spectrographs for the Refractor of. *H. C. Vogel* . . . 11, 393
Spectrograph, No. III, Electric Heating of. *J. Hartmann* . 15, 172
Spectroheliograph of. *P. Kempf* 21, 49
PRESSURE of Surrounding Gas on Temperature of Crater of Electric Arc Light, Effect of. *W. E. Wilson* 2, 212
Correction to Foregoing Article. *W. E. Wilson* and *G. F. Fitzgerald* 5, 101
of "Reversing Layer" of Solar Atmosphere. *L. E. Jewell, J. F. Mohler*, and *W. J. Humphreys* 3, 138
Effect of, on Wave-Lengths of Lines in Arc-Spectra of Certain Elements. *W. J. Humphreys* and *J. F. Mohler* . . 3, 114
W. J. Humphreys 4, 249
Application of Messrs. Jewell, Humphreys, and Mohler's Results to Certain Problems of Astrophysics. *George E. Hale* . 3, 156

VOLUME AND PAGE

PRESSURE (*Continued*)
Results of Jewell, Humphreys, and Mohler. *Arthur Schuster* . 3, 292
Effect of, on Wave-Lengths. (See also Errata, 4, 374.) *J. F. Mohler* 4, 175
Effect of, on Wave-Length. *W. J. Humphreys* . . 6, 169; 6, 428
Effect of, on Wave-Length, Theoretical Considerations Respecting. *J. Wilsing* 7, 317
Note on the Foregoing Article. *Charles Godfrey* . . . 8, 114
in the Spark. *Eduard Haschek* and *Heinrich Mache* . 9, 347; 12, 50
in the Electric Spark. *John Fred Mohler* 10, 202
Effect of, upon Wave-Lengths of Hydrogen Lines. *J. Wilsing* . 10, 269
Shift of Cadmium Line of Wave-Length 4800 Due to. *William B. Huff* 14, 41
of Light, Experimental Investigation of. *Peter Lebedew* . . 15, 60
Due to Light and Heat Radiation. *E. F. Nichols* and *G. F. Hull* 15, 62
Due to Radiation. *E. F. Nichols* and *G. F. Hull* . . . 17, 315
Application of Radiation, to Cometary Theory. *E. F. Nichols* and *G. F. Hull* 17, 352
of 37 Atmospheres on Certain Lines of Arc Spectrum of Iron, Effect of. *W. J. Humphreys* 22, 217
PRESSURES, High, Spark Spectrum of Iron in Liquids and in Air at. *George E. Hale* 15, 132
George E. Hale and *Norton A. Kent* 17, 154
PRESSURE-Shift of Spectrum Lines, Attempt to Find Cause of Width and. *W. J. Humphreys* 23, 233
PRINCETON, Results of Solar Observations at, 1905–1906. *Walter M. Mitchell* 24, 78
PRISM, A New Form of Objective. *F. L. O. Wadsworth* . . 1, 232
of Great Resolving Power, New Multiple Transmission. *F. L. O. Wadsworth* 2, 264
New Form of Fluid, without Solid Walls and Its Use in Objective Spectroscope. *F. L. O. Wadsworth* . . . 4, 274; 5, 149
of Uniform Dispersion. *Charles G. Abbot* and *Frederick E. Fowle, Jr.* 11, 135
and Grating Spectroscope, Comparison of. *N. Ernest Dorsey* . 12, 164
Action of, on White Light. *J. S. Ames* 22, 76
PRISMATIC Spectrum, Interpolation Formula for. *J. Hartmann* . 8, 218
PRISMS, Determination of Radial Motions by Objective. *Edward C. Pickering* 23, 255
PROJECTION Drawing, Distortion Due to Lens in. *Frederick Slocum* 6, 259
PROMINENCE Observed December 24, 1894, Very Large. *J. Fényi* . 1, 212
Large Eruptive. *George E. Hale* 1, 433
Rise of a Large, on June 1, 1900. *J. Fényi* 12, 215

VOLUME AND PAGE

PROMINENCES, Two Solar, Observed July 15 and September 30, 1895. *J. Fényi* 3, 192
Effect of Eclipse on Visibility of. *George E. Hale* . . . 3, 374
Observed on August 8, 1896. (See also Errata, 6, 58.) *J. Fényi* 4, 263
Observed at Kalocsa on May 28, 1900. *J. Fényi* 12, 24
and Terrestrial Magnetism. *A. L. Cortie* 18, 287
PUBLICATIONS, Recent. 1, 93, 189, 270, 354, 447; 2, 83, 169, 243, 328, 396; 3, 80, 164, 242, 314, 402; 4, 85, 167, 244, 311, 375; 5, 71, 154, 227, 293, 365; 6, 59, 164, 264; 7, 221.
PULFRICH'S Modification of the Littrow Spectroscope. *James E. Keeler* 1, 353
PULKOWA Refractor, Spectrographic Performance of Thirty-Inch. *A. Belopolsky* 1, 366
Observatory, Performance of an Auxiliary Lens for Spectrographic Investigations with the Thirty-Inch Refractor of. *A. Belopolsky* 3, 147
Observations of Standard Velocity Stars at. *A. Belopolsky* . 19, 85
Determination of Radial Velocities at. *A. Belopolsky* . . 21, 55
V Puppis, New Spectroscopic Binary, *Edward C. Pickering* . . 4, 373
Orbit of. *Alexander W. Roberts* 13, 177
ζ Puppis, Spectrum of. *Edward C. Pickering* . 5, 92; 6, 259; 13, 230
H. Kayser 5, 95
Stars Resembling. *Edward C. Pickering* 8, 119
RR Puppis, Orbit of. *Alexander W. Roberts* 13, 177
PURKINJE Phenomenon and Spectrum of the *Orion* Nebula. *W. W. Campbell* 8, 317
Phenomenon, Influence of, on Observations of Faint Spectra. *W. W. Campbell* 10, 22
PYRHELIOMETER, Electric Compensation. *Knut Ångström* . . 9, 332
QUARTZ Spectrograph, A Large. *Percival Lewis* 23, 390
RADIAL Velocity. See also VELOCITIES
Velocity Determination, Probable Error of. *W. W. Campbell* . 11, 167
Motions, Determination of, by Objective Prisms. *Edward C. Pickering* 23, 255
RADIATING Power from Center toward Limb of Solar Disk, New Method for Determining Rate of Decrease of. *W. H. Julius* 23, 312
RADIATION, Electromagnetic Nature of Solar. *H. Ebert* . . 2, 55
of Incandescent Platinum. *Harry Fielding Reid* . . . 2, 160
Contribution to the Theory of. *G. Jaumann* 2, 215
Paschen's Laws of. *F. W. Very* 2, 316
Reply to the Foregoing Article. *F. Paschen* 3, 150
Further Considerations in Regard to Laws of. *Frank W. Very* 4, 38

VOLUME AND PAGE

RADIATION (*Continued*)
in Magnetic Field. *A. A. Michelson* . . . 6, 48; 7, 131
On the Analysis of Electric. *G. F. Hull* 6, 455
Variation of Solar. *Frank W. Very* 7, 255
of Light, Influence of Magnetic Field on. *H. A. Lorentz* . 9, 37
from a Perfect Radiator. *W. E. Wilson* 10, 80
of a Black Body. *C. E. Mendenhall* and *F. A. Saunders* . . 13, 25
Heat, of Long Wave-Length Emitted by Black Bodies. *H. Rubens* and *F. Kurlbaum* 14, 335
Pressure Due to Light and Heat. *E. F. Nichols* and *G. F. Hull* 15, 62
of Mercury in Magnetic Field. *C. Runge* and *F. Paschen* 15, 235; 16, 118
Pressure Due to. *E. F. Nichols* and *G. F. Hull* . . . 17, 315
Pressure, Application of, to Cometary Theory. *E. F. Nichols* and *G. F. Hull* 17, 352
of Radium at Ordinary Temperatures, Spectrum of Spontaneous Luminous. *Sir William* and *Lady Huggins* 18, 151, 390; 22, 204; 23, 152
Absorption of, by the Solar Atmosphere. *Frank W. Very* . . 19, 139
Possible Variation of Solar, and Its Probable Effect on Terrestrial Temperatures. *S. P. Langley* 19, 305
through a Foggy Atmosphere. *Arthur Schuster* . . . 21, 1
of Corona, Comparative Luminosity and Total. *S. P. Langley* 21, 194
High-Temperature. *P. G. Nutting* 21, 400
of Sun-Spots and Faculae, Ultra-Violet. *K. Schwarzschild* and *W. Villiger* 23, 345
of Canal Rays in Hydrogen. *J. Stark* 25, 23, 170
RADIOMETER, New Form of. *F. A. Saunders* 14, 136
RADIUM, Spectrum of. *C. Runge*. 12, 1
Flame Spectrum of. *C. Runge* and *J. Precht* 17, 147
Position of, in the Periodic Series According to its Spectrum. *C. Runge* and *J. Precht* 17, 232
Spectrum of Spontaneous Luminous Radiation of, at Ordinary Temperatures. *Sir William* and *Lady Huggins* 18, 151, 390; 22, 204; 23, 152
RANYARD Mounting for Reflecting Telescopes. *F. L. O. Wadsworth* 5, 132
George E. Hale . 5, 148
RATIO, Method of Determining Value of Light. *Alexander W. Roberts* 4, 265
RAYLEIGH, Lord, Note on Discovery of Error in Papers of, Dealing with Application of Principles of Wave Theory to Determination of Intensity of Images of Fine Lines and Extended Areas at the Focus of a Telescope. *F. L. O. Wadsworth* . . 7, 77
RAYS, Röntgen's X-. *J. S. Ames*. 3, 294
Atmospheric Absorption of Visible. *A. Cornu* . . . 13, 142

VOLUME AND PAGE

RAYS (*Continued*)
On the Radiation of Canal, in Hydrogen. *J. Stark* . 25, 23, 170
On Hull's Observations of Doppler Effect in Canal. *J. Stark* . 25, 230
Doppler Effects and Polarization in Canal. *G. F. Hull* . . 25, 234
REACTIVITY of Carbonyl Group, as Measured by its Absorption Spectrum. *A. W. Stewart* and *E. C. C. Baly* . . . 24, 95
RECIPROCITY, Deviations from Law of, for Bromide of Silver Gelatine. *K. Schwarzschild* 11, 89
REDUCTION to Sun in Radial Velocity Determinations, Short Method of Computing Approximate Value of. *H. K. Palmer* . 24, 51
REFLECTING Surfaces, Use of Cylinder Oils for. *Samuel V Hoffman* 3, 293
and Refracting Telescopes, Comparative Value of, for Astrophysical Investigations. *George E. Hale* 5, 119
Telescopes, New Form of Mounting, Devised by Arthur Cowper Ranyard. *F. L. O. Wadsworth* 5, 132
George E. Hale 5, 148
Telescopes, Possible Form of Mirror for. *Charles Lane Poor* . 6, 440
Telescope, Field of. *S. C. Reese* 12, 219
Powers of Glass and Silvered Glass Mirrors. *C. A. Chant* . 21, 211
Telescopes of Relatively Short Focus. (See also Errata, 24, 369.) *H. C. Vogel* 23, 370
REFLECTION in Infra-Red Spectrum, Selective. *James T. Porter* . 22, 229
Selective, and Polarization in the Infra-Red Spectrum. *A. H. Pfund* 24, 19
Regular and Diffuse. *W. W. Coblentz* 25, 282
REFLECTOR for the Lick Observatory, A Large. *Edward S. Holden* 1, 442
Crossley, of Lick Observatory. (See also Correction, 16, 121.) *James E. Keeler* 11, 325
Two-Foot, of the Yerkes Observatory. *G. W. Ritchey* . . 14, 217
of the Yerkes Observatory, Comet Photography with Two-Foot. *G. W. Ritchey* 16, 178
Crossley, Photographs of Nebulae and Star Clusters, Note Concerning Publication of. *W. W. Campbell* 20, 295
REFLECTORS, Support System for Large. *G. W. Ritchey* . . . 5, 143
for Eclipse Work, Note on. *W. J. Humphreys* . . . 16, 341
REFRACTING and Reflecting Telescopes, Comparative Value of, for Astrophysical Investigations. *George E. Hale* . . . 5, 119
REFRACTION and Dispersion, Graphical Study of. *A. De Gramont* . 13, 208
REFRACTOMETER, New Form of. *C. Pulfrich* 3, 259
REFRACTOR, Spectrographic Performance of Thirty-Inch Pulkowa. *A. Belopolsky* 1, 366
of Cambridge Observatory, Bruce Spectroscope of. Modern Spectroscope. XVII. *H. F. Newall* 3, 266

VOLUME AND PAGE

REFRACTOR (*Continued*)
of Potsdam Observatory, Absorption of Light as Determining Factor in Selection of Size of Objective for. *H. C. Vogel* . 5, 75
of Potsdam Astrophysical Observatory 11, 100
REGIONS, Herschel's Nebulous. *Isaac Roberts* 17, 72
REPLICAS, Diffraction Grating. *Robert James Wallace* . 22, 123; 23, 96
REPLY to Recent Article by Louis Bell. *A. Perot* and *C. Fabry* . 16, 36
to Professor F. R. Moulton. *W. H. Pickering* . . . 22, 357
to Recent Statements by M. Deslandres. *George E. Hale*. . 23, 92
RESOLVING Power of Spectroscopes, Tables of. *F. L. O. Wadsworth* 6, 27
RESEARCH, International Co-operation in Solar. *C. D. Perrine* . 20, 301
Co-operation in Solar. *George E. Hale* 20, 306
Program of Solar. *George E. Hale* 23, 1
RESULTS, Miscellaneous. *Edward C. Pickering* 16, 336
REVERSAL, Double. *W. J. Humphreys* 18, 204
H. Konen and *A. Hagenbach* 19, 111
of Bands. *W. J. Humphreys* 22, 220
REVERSALS in Spectrum Photographs, Photographic. *R. W. Wood* . 17, 361
in Spectra of Sun-Spots. *Walter M. Mitchell* 19, 357
REVERSING Layer of Solar Atmosphere, Pressure of. *L. E. Jewell*, *J. F. Mohler*, and *W. J. Humphreys* 3, 138
Stratum and Its Spectrum. *C. A. Young* 6, 155
Layer, Depth of. *E. J. Wilczynski* 7, 213
Layer Photographed with a Concave Rowland Grating. *J. F. Mohler* and *F. C. Daniel* 12, 361
REVIEWS
Ambronn, L. *Handbuch der astronomischen Instrumentenkunde* (George E. Hale) 15, 347
Ambronn, J., R., and L. *Sternverzeichnis* (Edwin B. Frost) . 25, 153
Ames, Joseph S., Editor. Harper's Scientific Memoirs. No. 1, *The Free Expansion of Gases;* No. 2, *Prismatic and Diffraction Spectra* (Ernest F. Nichols) 9, 277
Andoyer, H. *Cours d'astronomie*, Première partie (Kurt Laves) 25, 288
Anthony and Brackett. *Elementary Text-Book on Physics* (Henry Crew) 5, 360
Arendt, Th. *Die Schwankungen im Wasserdampfgehalte der Atmosphäre auf Grund spectroskopischer Untersuchungen* (E. B. Frost) 5, 152
Arrhenius, Svante. *Ueber die Ursache der Nordlichter* (*A. W.* Augur) 13, 344
Ball, Robert S. *A Popular Guide to the Heavens* (Storrs B. Barrett) 24, 367

VOLUME AND PAGE

REVIEWS (*Continued*)

Baly, E. C. C. *Spectroscopy* (Henry Crew) 23, 170

Becquerel, Henri. *Sur diverses propriétés des rayons uraniques* (J. S. Ames) 5, 66

Belopolsky, A. *Étude sur le spectre de l'étoile variable δ Cephei* (Edwin B. Frost) 1, 263

Belopolsky, A. *Spectrographische Untersuchungen des Saturnringes* (James E. Keeler) 3, 79

Bidschof, F., und A. Vital. *Fünfstellige mathematische und astronomische Tafeln* (Edwin B. Frost) 24, 368

Boccardi, J. *Guide du calculateur* (Frank Schlesinger) . . 22, 161

Boys, C. V. *On the Newtonian Constant of Gravitation* (F. L. O. Wadsworth) 3, 303

Braun, Carl. *Die Gravitations Constante, die Masse und mittlere Dichte der Erde* (F. L. O. Wadsworth) 6, 159

British Astronomical Association. *The Indian Eclipse* (George E. Hale) 10, 374

Burnham, S. W. *A General Catalogue of 1290 Double Stars Discovered from 1871 to 1899 by S. W. Burnham* (E. E. Barnard) 12, 228

Chwolson, O. D. *Lehrbuch der Physik*, Band I (Henry Crew). 18, 396

Chwolson, O. D. *Lehrbuch der Physik*, Band II (Edwin B. Frost) 22, 227

Clerke, Agnes M. *Problems in Astrophysics* (W. W. Campbell) 18, 156

Clerke, Agnes M. *History of Astronomy in the Nineteenth Century*. Fourth Edition (Storrs B. Barrett) 18, 397

Constan, P. *Cours élémentaire d'astronomie et de navigation* (Frank Schlesinger) 19, 389

Deslandres, H. *Recherches spectrales sur l'étoile Altaïr. Reconnaissance d'un mouvement orbital et d'une atmosphère* (James E. Keeler) 3, 78

Deslandres, H. *Observations de l'éclipse totale du soleil du 16 Avril 1893* (George E. Hale) 4, 160

Deslandres, H., and E. W. Maunder. *Proposed Methods of Applying the Object-Glass Prism to the Measurement of Stellar Motions* (James E. Keeler) 3, 311

Drude, Paul. *The Theory of Optics* (Norton A. Kent) . . 18, 75

Eder, J. M., and E. Valenta. The Spectrum Researches of J. M. Eder and E. Valenta (J. S. Ames) 1, 443

Eder und Valenta. *Ueber drei verschiedene Spectren des Argons. Ueber die Spectren von Kupfer, Silber und Gold* (J. S. Ames) 3, 396

Eder, J. M., und E. Valenta. *Beiträge zur Photochemie und Spectralanalyse* (Edwin B. Frost) 23, 171

VOLUME AND PAGE

REVIEWS (*Continued*)

Exner, Franz, und E. Haschek. *Ueber die ultravioletten Funkenspektra der Elemente* (Henry Crew) 5, 290

Exner, Franz, und E. Haschek. *Wellenlängen-Tabellen für spektralanalytische Untersuchungen, auf Grund der ultravioletten Funkenspektren der Elemente* (Edwin B. Frost) . . . 19, 302

Fabry and Buisson's Wave-Lengths of Standard Lines (Storrs B. Barrett) 25, 362

Fechner, Gustav Theodor. *Kollektivmasslehre* (Henry S. White) 10, 70

Foerster, Wilhelm. *Astrometrie; oder, Die Lehre von der Ortsbestimmung im Himmelsraume* (Kurt Laves) 22, 283

Galitzin, Fürst B. *Zur Theorie der Verbreiterung der Spectrallinien* (Henry Crew) 2, 324

Garbasso, A. *Vorlesungen über theoretische Spektroskopie* (Henry Crew) 24, 303

Gehrcke, E., and O. von Baeyer. *Resolution of Spectral Lines by Means of Interference Points Produced by Plane-parallel Plates* (A. H. Pfund) 24, 364

Gramont, Arnaud de. *Analyse spectrale directe des minéraux* (George E. Hale) 5, 362

Hagen, J. G. *Atlas Stellarum Variabilium*, Series V (J. A. Parkhurst) 24, 59

Hagen, J. G. *Atlas Stellarum Variabilium*, Series IV (J. A. Parkhurst) 25, 361

Hagenbach, A., and H. Konen. *Atlas of Emission Spectra of Most of the Elements* (Henry Crew) 22, 226

Halm, J. *Spectroscopic Observations of the Rotation of the Sun* (W. S. Adams) 21, 385

Hartley, W. N. *On Variations Observed in the Spectra of Carbon Electrodes, and on the Influence of One Substance on the Spectrum of Another* (J. S. Ames) 1, 88

Hartley, W. N. *Flame Spectra at High Temperatures*. II and III (J. S. Ames) 1, 89

Harvard Photometry during the Years 1891–1894, Photometric Revision of (J. A. Parkhurst) 12, 236

Harvard College Astronomical Observatory, Annals of, Vol. XXXIII. *Observations of Variable Stars by Argelander, Schönfeld, and Schmidt* (J. A. Parkhurst) 12, 305

Hemsalech, G. A. *Recherches expérimentales sur les spectres d'étincelles* (Henry Crew) 14, 370

Heysinger, I. W. *The Source and Mode of Solar Energy throughout the Universe* (James E. Keeler) 1, 268

VOLUME AND PAGE

REVIEWS (*Continued*)

Hills, E. H. *The Total Eclipse of April 16, 1893. Report on Results Obtained with the Slit Spectroscopes* (E. B. Frost) . 1, 91

Huggins, Sir William. *The Royal Society, or Science in the State and in the Schools*. (Edwin B. Frost) 24, 368

Huggins, Sir William and Lady. *An Atlas of Representative Stellar Spectra* (George E. Hale) 12, 291

Janicki, L. *Analysis of the Spectrum Lines of Mercury, Cadmium, Sodium, Zinc, Thallium and Hydrogen* (James Barnes) . 24, 56

G. Jaumann. *Bemerkung zu der Abhandlung über Lichtemission* (James E. Keeler) 2, 241

Jeans, J. H. *The Dynamical Theory of Gases* (W. P. Boynton) . 22, 224

Kayser, H. *Handbuch der Spectroscopie.* I (Henry Crew) . . 15, 150

Kayser, H. *Handbuch der Spectroscopie.* II (George E. Hale) . 19, 296

Kayser, H. *Handbuch der Spectroscopie.* III (William W. Coblentz) 22, 281

Kayser, H., und C. Runge. *Beiträge zur Kenntniss der Linien-Spectren* (J. S. Ames) 1, 90

Kayser, H., und C. Runge. *Ueber die Spectra von Zinn, Blei, Arsen, Antimon, Wismuth* (J. S. Ames) 1, 91

König, Arthur. *Ein neues Spectralphotometer* (James E. Keeler) 2, 81

Köttgen, Else. *Untersuchung der spectralen Zusammensetzung verschiedener Lichtquellen* (James E. Keeler) 2, 82

Kononowitsch, A., N. Zwietinowitsch, A. Orbinskij. *Observations des protubérances solaires faites à l'Observatoire d'Odessa* (George E. Hale) 3, 241

Landauer, John. *Die Spectralanalyse* (James E. Keeler) . . 4, 156

Langley, S. P. *Annals of the Astrophysical Observatory of the Smithsonian Institution*, Vol. I (George E. Hale) . . 13, 280

Lefèvre, Julien. *La spectrométrie* (James E. Keeler) . . 4, 156

Lefèvre, Julien. *La spectroscopie* (James E. Keeler) . . 4, 156

Lick Observatory. *Publications*, Volume III (George E. Hale) 1, 180

Lick Observatory. *Atlas of the Moon* (J. E. Keeler) . . 5, 150

Liveing and Dewar. *On the Spectrum of the Electric Discharge in Liquid Oxygen, Air and Nitrogen* (J. S. Ames) . . 1, 88

Lockyer, J. Norman. *Preliminary Report on the Results Obtained with the Prismatic Camera during the Total Eclipse of the Sun, April 16, 1893* (E. B. Frost) 1, 91

Lockyer, J. Norman. *On the Photographic Spectrum of the Great Nebula in Orion* (James E. Keeler) 3, 229

Lockyer, J. Norman. *Total Eclipse of the Sun, April 16, 1893* (George E. Hale) 5, 220

Mach, Ernst. *Popular Scientific Lectures* (Henry Crew) . . 1, 267

VOLUME AND PAGE

REVIEWS (*Continued*)

Mann, C. Riborg. *Manual of Advanced Optics* (A. G. Stillhamer) 23, 175

Marcuse, Adolph. *Handbuch der geographischen Ortsbestimmung für Geographen und Forschungsreisende* (Harold Jacoby) 23, 178

Maunder, E. W. *The Indian Eclipse* (George E. Hale) . . 10, 374

McLean, Frank. *Comparative Photographic Spectra of Stars to the $3\frac{1}{2}$ Magnitude; Spectra of Southern Stars* (Edwin B. Frost) 10, 367

Michelson, A. A. *Light Waves and Their Uses* (H. M. Reese) . 19, 300

Miremont, Comte de. *Popular Star Maps: A Rapid and Easy Method of Finding the Principal Stars* (J. A. Parkhurst) . 22, 163

Moulton, F. R. *Introduction to Astronomy* (Mary W. Whitney) 25, 151

Müller, G. *Die Photometrie der Gestirne* (Edwin B. Frost) . 7, 311

Müller, G., and P. Kempf. *Photometrische Durchmusterung des nördlichen Himmels, enthaltend alle Sterne der B.D. bis zur Grösse 7.5* (J. A. Parkhurst) 10, 59

Müller, G., und P. Kempf. *Generalkatalog der Potsdamer photometrischen Durchmusterung des nördlichen Himmels* (J. A. Parkhurst) 25, 286

Müller, P. Adolfo. *Elementi di Astronomia ad uso del Scuole e per Istruzione privata* (William F. Rigge) 24, 307

Newcomb, Simon. *A Compendium of Spherical Astronomy with Its Application to the Determination and Reduction of Positions of the Fixed Stars* (F. H. Seares) 24, 305

O Gyalla. *Beobachtungen angestellt am Astrophysikalischen Observatorium in* (James E. Keeler) 2, 81

Paris, Annales de l'Observatoire d'Astronomie Physique de. Tome premier (George E. Hale) 10, 369

Paschen, F. *Ueber Gesetzmässigkeiten in den Spectren fester Körper* (Henry Crew) 5, 60

Paschen, F. *Ueber Gesetzmässigkeiten in den Spectren fester Körper*, Second Part (C. E. Mendenhall) 7, 215

Perot, A., and Ch. Fabry. *Sur une nouvelle méthode de spectroscopie interférentielle; étude de quelques radiations par la spectroscopie interférentielle* (A. St. C. Dunstan). . . 8, 60

Pflüger, A. 1. *Anomalous Dispersion Curves of Some Solid Dyes.* 2. *On the Anomalous Dispersion of Absorbing Substances.* 3. *On the Indices of Refraction at Different Temperatures* (C. E. Mendenhall) 5, 67

Pflüger, A. *Verification of the Ketteler-Helmholtz Dispersion Formulae by Optical Constants of Solid Dyes* (G. O. James) 9, 187

VOLUME AND PAGE

REVIEWS (*Continued*)

Pflüger, A. *Verification of Cauchy's Formulae for Metallic Reflection by Optical Constants of Solid Cyanin* (G. O. James) 9, 187

Pickering, William H. *The Moon: A Summary of the Existing Knowledge of Our Satellite, with a Complete Photographic Atlas* (E. E. Barnard) 20, 359

Potsdam. *Publications des Astrophysikalischen Observatoriums: Photographische Himmelskarte*, Band I (Edwin B. Frost) 12, 297

Risteen, A. D. *Molecules and the Molecular Theory of Matter* (H. Crew) 2, 392

Rohr, M. von. *Theorie und Geschichte des photographischen Objectivs* (Stanley C. Reese) 15, 70

Rohr, M. von. *Die Bilderzeugung in optischen Instrumenten vom Standpunkte der geometrischen Optik* (Walter S. Adams) . 19, 387

Rohr, M. von. *Die optischen Instrumente* (Stanley C. Reese) . 23, 176

Rosse's, Lord, Lecture on the Radiant Heat from the Moon during an Eclipse 4, 154

Rousdon Observatory, Observations of Variable Stars Made at (J. A. Parkhurst) 20, 364

Rydberg, J. R. *Beiträge zur Kenntniss der Linien-Spectren* (J. S. Ames) 1, 90

Scheiner, J. *Untersuchungen über die Spectra der helleren Sterne* (Edwin B. Frost) 2, 386

Scheiner, J. *Die Photographie der Gestirne* (Frank Schlesinger) 10, 132

Scheiner, J. *Strahlung und Temperatur der Sonne* (Edwin B. Frost) 12, 303

Schuster, Arthur. *An Introduction to the Theory of Optics* (E. F. Nichols) 21, 382

See, T. J. J. *Spectroscopy of Binary Systems* (E. B. Frost) . 3, 232

Simon, H. Th. *On a New Photographic Method of Photometry and Its Use in the Ultra-Violet* (C. E. Mendenhall) . . 5, 69

Smithells, A. *The Luminosity of Gases*, III (Henry Crew) . 1, 266

Smithsonian Astrophysical Observatory. *Report for 1895* (F. L. O. Wadsworth) 3, 398

Smithsonian Institution. *Annals of the Astrophysical Observatory*, Vol. I, S. P. Langley (George E. Hale) 13, 280

Stanley, William Ford. *Notes on the Nebular Theory in Relation to Stellar, Solar, Planetary, Cometary, and Geological Phenomena* 4, 159

Stark's Theory of Radiation (J. A. Anderson) 24, 362

Stokes, G. G. *Mathematical and Physical Papers* (J. S. Ames) 23, 173

Stoney, G. Johnstone. *On the Equipment of the Astro-Physical Observatory of the Future* (F. L. O. Wadsworth) . . 4, 238

VOLUME AND PAGE

REVIEWS (*Continued*)
Sutherland, William. *The Cause of the Structure of Spectra* (George W. Middlekauff) 15, 350
Thomson, J. J. *On the Electrolysis of Gases* (R. A. Fessenden) . 2, 394
Thomson's, J. J., Work on the Structure of the Atom (Henry Crew) 11, 170
Travers, Morris W. *Some Experiments on Helium* (W. H. Wright) 5, 363
Tuckerman, Alfred. *Index to the Literature of the Spectroscope* [1887–1900] (Edwin B. Frost) 22, 162
Turner, Herbert Hall. *Astronomical Discovery* (C. A. Young) . 21, 383
Vogel, H. C. *Ueber das Spectrum von Mira Ceti* 4, 158
Vogel, H. C. *Newcomb-Englemanns Populäre Astronomie* (Edwin B. Frost) 23, 174
Vogel, H. C., und J. Wilsing. *Untersuchungen über die Spectra von 528 Sternen* (Edwin B. Frost) 10, 362
Walter, B. *On the Indices of Refraction of Solid Fuchsin* (C. E. Mendenhall) 5, 67
Watts, W. Marshall. *An Introduction to the Study of Spectrum Analysis* (Edwin B. Frost) 23, 177
J. Wilsing und J. Scheiner. *Ueber einen Versuch eine electrodynamische Sonnenstrahlung, und über die Aenderung des Uebergangswiederstand bei Berührung zweier Leiter durch electrische Bestrahlung* (Henry Crew) 5, 219
Wood, R. W. *Experimental Determinations of the Temperature in Geissler Tubes* (Henry Crew) 5, 63
Wood, R. W. *The Anomalous Dispersion of Cyanin* (G. O. James) 9, 187
Wood, Robert W. *Physical Optics* (H. G. Gale) 25, 290
Young, Charles A. *The Sun* (George E. Hale) 3, 235
RHEOSTAT for Bolometers, Balancing. *P. G. Nutting* . . . 11, 44
RHODIUM, Arc-Spectrum of. *H. A. Rowland* and *R. R. Tatnall* . 3, 286
Wave-Number System of. *C. P. Snyder* 14, 179
ROMAN COLLEGE, Distribution in Latitude of Solar Phenomena Observed at Royal Observatory of, in 1894. *P. Tacchini* 2, 26
Solar Observations Made at, 1894–1898. *P. Tacchini* 1, 210; 2, 224; 3, 252; 4, 182; 5, 159; 6, 244; 7, 170; 8, 223
RÖNTGEN'S X-Rays. *J. S. Ames* 3, 294
RÖSSGEN. New Astrophysical Observatory at 4, 236
ROTATION of a Planet, The Displacement of Spectral Lines Caused by. *James E. Keeler* 1, 352
of Sun, Law of. *J. Wilsing* 3, 247
Jewell's Researches on Solar 4, 138

VOLUME AND PAGE

ROWLAND, Henry A. The Collected Physical Papers of . . . 15, 342
The Henry A., Memorial Library. *Joseph S. Ames* . . 17, 247
ROWLAND'S Table of Wave-Lengths. See under SOLAR SPECTRUM
Solar Spectrum. Systematic Errors in Wave-Lengths of. *G. Eberhard* 17, 141
System of Wave-Lengths, Revision of. (See also Errata, 19, 84). *J. Hartmann*. 18, 167
Wave-Lengths, Perot-Fabry Corrections of. *Louis Bell* . . 18, 191
Wave-Lengths, Corrections to. *C. Fabry* and *A. Perot* . . 19, 119
System of Standard Wave-Lengths, Revision of. *Lewis E. Jewell* 21, 23
Ruling Machines, Present Condition of. *J. S. Ames* . . 23, 348
ROYAL Astronomical Society, Award of Gold Medal of, to Professor Barnard. *George E. Hale* 5, 215
Society, Letter Regarding Proceedings of. *J. Larmor* . . 24, 55
RUBIDIUM, Spectrum of. *Hugh Ramage* 16, 43
Some Additions to Arc-Spectrum of. *F. A. Saunders* . . 20, 188
RULING Machines, Present Condition of Rowland's. *J. S. Ames* . 23, 348
RUMFORD Spectroheliograph, Work of. *George E. Hale* . . . 21, 261
Spectroheliograph, Observations with. *Philip Fox* . . . 21, 351
RUTHENIUM, Arc-Spectrum of. *H. A. Rowland* and *R. R. Tatnall* . 3, 286
H. Kayser 7, 93
RUTILE, Occurrence of Vanadium in Scandinavian. *B. Hasselberg* . 5, 194
Chemical Composition of. *B. Hasselberg* 6, 22
Presence of Vanadium in. *H. A. Rowland* 6, 157
B. Hasselberg 6, 369
S Sagittae, Radial Velocity of. *Ralph H. Curtiss* 20, 231
Sagittarii, Nova. Edward C. Pickering 9, 182, 269
Position of. *Edward C. Pickering* 10, 285
Spectrum of. *W. W. Campbell* 9, 308
B. Hasselberg 6, 369
v Sagittarii, Variable Velocity of, in Line of Sight. *W. W. Campbell* 10, 241
W Sagittarii, Applications to Study of Variable Star. Method of Measurement and Reduction of Spectrograms for Determination of Radial Velocities. *Ralph H. Curtiss* . . . 20, 149
Light- and Velocity-Curves of. *R. H. Curtiss* . . . 22, 274
Y Sagittarii, Radial Velocity of. *Ralph H. Curtiss* . . . 20, 231
SATELLITE, Eclipse of *Jupiter's* Fourth, February 19, 1895. *E. C. Pickering* 1, 309
to the Moon, Photographic Search for. *E. E. Barnard* . . 2, 347
SATELLITES, Photographic Observations of Eclipses of *Jupiter's*. *Willard P. Gerrish* 1, 146
Forms of Disks of *Jupiter's*. *S. I. Bailey* 2, 97

VOLUME AND PAGE

SATELLITES (*Continued*)
Atmospheres upon. (See also Errata, 8, vii.) *G. Johnstone Stoney* 7, 25
and Asteroids, Light-Variations of. *Henry Norris Russell* . 24, 1
Saturn, Form of Lines in Spectrum of. *James E. Keeler* . . 2, 63
Spectrographic Determination of Velocities in the System of. *W. W. Campbell* 2, 127
New Satellite of. *Edward C. Pickering* 9, 173, 274
Ninth Satellite of. *Edward C. Pickering* 20, 357
Heat Radiation of. *E. F. Nichols* 13, 101
Saturn's Rings, Spectroscopic Proof of Meteoric Constitution of. *James E. Keeler* 1, 416; 2, 163
Rings, Spectrum of. *George E. Hale* 9, 185
SCANDINAVIAN Rutile, Occurrence of Vanadium in. *B. Hasselberg* . 5, 194
SCHMIDT'S Theory of the Sun. *E. J. Wilczynski* . . . 1, 112; 2, 69
James E. Keeler 1, 178
George E. Hale 2, 69
SCHUMANN, Preliminary Measurement of Short Wave-Lengths Discovered by. *Theodore Lyman* 19, 263
RW Scorpii, New Variable Star. *M. Fleming* 2, 354
μ^1 *Scorpii*, New Spectroscopic Binary. *Edward C. Pickering* . . 4, 235
π and δ *Scorpii*, Great Photographic Nebula near. *E. E. Barnard* . 23, 144
SCREENS Transparent Only to Ultra-Violet Light and Their Use in Spectrum Photography. *R. W. Wood* 17, 133
R Scuti, Spectrum of. *Ralph H. Curtiss* 20, 232
SECCHI'S Third Type, Spectra of Stars of. *James E. Keeler* . . 6, 423
Fourth Type Stars, Spectra of. *George E. Hale* 9, 271
George E. Hale and *Ferdinand Ellerman* 10, 87
Third and Fourth Types, Comparison of. *George E. Hale* . 9, 273
SELENIUM, Series Spectra of. *C. Runge* and *F. Paschen* . . 8, 70
Cells, Observations Made with, during Total Eclipse, August 30, 1905. *Th. Wulf* and *J. D. Lucas* 23, 153
SELF-INDUCTION, Effect of, upon Spark-Spectra of Metalloids. *Henry Crew* 16, 59
Effect of Capacity and, upon Wave-Length in Spark Spectrum. *George W. Middlekauff* 21, 116
SELLMEIER'S Dynamical Theory, Application of, to Dark Lines D_1, D_2 Produced by Sodium Vapor. *Lord Kelvin* 9, 231
SENSITOMETRY, Studies in. I. The Daylight Sensitometry of Photographic Plates, and a Suggested Standard Dispersion-Piece. *Robert James Wallace* 25, 116
SEQUENCES, Accuracy of Eye-Estimates of Magnitudes by Method of. *Alexander W. Roberts* 4, 184

VOLUME AND PAGE

SERIES, Law of Spectral. *T. N. Thiele* 6, 65
Spectra of Oxygen, Sulphur, and Selenium. *C. Runge* and *F. Paschen* 8, 70
Lines in Magnetic Field, Separation of Corresponding. *C. Runge* and *F. Paschen* 15, 333; 16, 123
Position of Radium in the Periodic, According to Its Spectrum. *C. Runge* and *J. Precht* 17, 232
On Formulae for Spectrum. *A. Fowler* and *H. Shaw* . . 18, 21
Relations, Effects of Change of Atmosphere on Arc Spectra with Reference to. *A. S. King* 18, 129
Enhanced, of Titanium, Iron, and Nickel. *H. M. Reese* . . 22, 222
Formulae for Distribution of Spectrum Lines in. *T. S. Elston* 23, 162
Theory for Distribution of Spectral Lines in. *T. S. Elston* . 23, 346
SHIFT of Spectral Lines, Cause for. *George F. Fitzgerald* . . 5, 210
W. J. Humphreys . . 23, 233
of Cadmium Line of Wave-Length 4800 Due to Pressure. *William B. Huff* 14, 41
SHUTTER for Concave Grating Spectroscopes, Occulting. *H. M. Reese* 24, 49
SIDEROSTAT, Diurnal Rotation of Field of. *M. A. Cornu* . . 11, 148
SIDEROLITES, Spectrographic Analysis of. *W. N. Hartley* and *Hugh Ramage* 9, 221
SILICON, Spectrum of. *Franz Exner* and *Eduard Haschek* . . 12, 48
Joseph Lunt 11, 262; 22, 256
Lines λ 4128 and λ 4131, Wave-Lengths of. *J. Hartmann* . 18, 65
Lines in Spark and Stellar Spectra. *A. De Gramont* . . 20, 233
Lines, Wave-Lengths of Certain. *E. B. Frost* and *J. A. Brown* . 22, 157
SILVER Bromide Gelatine, Deviations from the Law of Reciprocity for. *K. Schwarzschild* 11, 89
Bromide Gelatine, Effect of Intermittent Exposure on. *K. Schwarzschild* 11, 92
Spectrum of Hydrogen Given by Metallic Arc of. *O. H. Basquin* 14, 1
"Grain" in Photography. *Robert James Wallace* . . . 20, 113
SILVERING, Notes on Silvering Solutions and. *F. L. O. Wadsworth* . 1, 252
Sirius in Ancient Times, The Color of. *W. T. Lynn* . . . 1, 351
Variable Radial Velocity of. *W. W. Campbell* . . . 21, 176
SKY, Photographic Map of Entire. *Edward C. Pickering* . . 18, 70
SLIT, Loss of Light by Diffraction at a Narrow. *J. H. Moore* . . 20, 285
SMITHSONIAN Astrophysical Observatory, Spectro-Bolographic Investigations at. *George E. Hale* 1, 162
Institution, Grant to Astrophysical Journal by . 15, 297; 21, 81
SNOW Horizontal Telescope. *George E. Hale* . . . 17, 314
Telescope, Some Tests of the. *George E. Hale* . . . 23, 6
Fund of Yerkes Observatory. *Edwin B. Frost* . . . 24, 219

	VOLUME AND PAGE
SODIUM and Potassium Vapors, Fluorescence of. *Eilh. Wiedemann* and *G. C. Schmidt*	3, 207
Lines, Application of Sellmeier's Theory to. *Lord Kelvin*	9, 231
Effects of, on Hydrocarbon Bands in Spectrum of Bunsen Flame. *Percival Lewis*	15, 122
Bands in Bunsen Flame Spectrum. *Percival Lewis*	15, 296
Vapor, Fluorescence and Absorption Spectra of. (See also Erratum, 18, 235.) *R. W. Wood* and *J. H. Moore*	18, 94
SOLAR. See also SUN, CHROMOSPHERE, CORONA, ECLIPSE, PROMINENCE	
SOLAR Activity and Terrestrial Magnetism, Simultaneous Occurrences in. *A. Nippoldt*	20, 202
and Terrestrial Phenomena, Synchronous Variations in. *H. W. Clough*	22, 42
Atmosphere. *Arthur Schuster*	16, 320
Temperature of. *Arthur Schuster*	21, 258
Brester's Views as to Tranquillity of. *Egon von Oppolzer*	1, 260
Pressure of Reversing Layer of. *L. E. Jewell, J. F. Mohler,* and *W. J. Humphreys*	3, 138
Absorptive Power of. *Frank W. Very*	16, 73
Absorption of Radiation by, and Intrinsic Radiation of That Atmosphere. *Frank W. Very*	19, 139
Constant and Related Problems. *S. P. Langley*	17, 89
Disk, New Method for Determining Rate of Decrease of Radiating Power from Center toward Limb of. *W. H. Julius*	23, 312
Motion as Gauge of Stellar Distances. *Simon Newcomb*	6, 441
Nebula, Density of. *Anne Sewell Young*	13, 338
Observations at the Roman College, 1894–1898. *P. Tacchini*	1, 210; 2, 224; 3, 252; 4, 182; 5, 159; 6, 244; 7, 170; 8, 223
at Catania, 1894–1896. *A. Mascari*	2, 119; 4, 205; 6, 371
at Princeton, 1905–1906. *Walter M. Mitchell*	24, 78
Observatory. See also MOUNT WILSON	
of Carnegie Institution of Washington. *George E. Hale*	21, 151
Five-Foot Spectroheliograph of. *George E. Hale* and *Ferdinand Ellerman*	23, 54
Spectroscopic Laboratory of. *George E. Hale*	24, 61
Latitude and Longitude of. *George E. Hale*	24, 129
100-Inch Mirror for. *George E. Hale*	24, 214
Origin of Terrestrial Magnetic Disturbances. *E. W. Maunder*	21, 101
Phenomena Observed in 1894, Distribution in Latitude of. *P. Tacchini*	2, 26
New Point of View for Regarding. *J. Fényi*	4, 18
and Anomalous Dispersion. *W. H. Julius*	12, 185

VOLUME AND PAGE

SOLAR (*Continued*)
Radiation, Electromagnetic Nature of. *H. Ebert* . . . 2, 55
Variation of. *Frank W. Very* 7, 255
and Its Probable Effect on Terrestrial Temperatures, Possible Variation of. *S. P. Langley* 19, 305
Research at the Yerkes Observatory. *George E. Hale* . . 16, 211
Expedition for. *George E. Hale* 19, 385
International Co-operation in. *C. D. Perrine* . . . 20, 301
International Union for Co-operation in; Meeting at Oxford, September, 1905 . . . . . 22, 276
Co-operation in. *George E. Hale* 20, 306
at Mount Wilson, Study of Conditions for. *George E. Hale* 21, 124
Program of. *George E. Hale* 23, 1
Rotation, Hydrodynamical Investigations of. (See also Correction, 4, 310.) *E. J. Wilczynski* 4, 101
Remarks on the Foregoing Article. (See also Errata, 5, 278.) *Paul Harzer* 5, 36
Rotation, Jewell's Researches on 4, 138
Spectrum Wave-Lengths, Preliminary Table of. *Henry A. Rowland*
λλ 2975.587–3259.567 . . . . . 4, 106, 278
3259.720–3721.779 . . . . . 5, 11, 109, 181
3722.071–4674.484 . . . 1, 29, 131, 222, 295, 377
4674.648–5913.930 . . . 2, 45, 109, 188, 306, 360
5914.118–7331.225 . . . . 3, 141, 201, 356
Corrections and Additions 6, 384
Wave-Lengths, Systematic Errors in Rowland's. *G. Eberhard* 17, 141
Reversing Stratum and Its Spectrum. *C. A. Young* . . 6, 155
Photographic Normal. *George Higgs* 7, 86
Scale of Kirchhoff's. *J. Hartmann* 9, 69
Appearance of, near the Hydrogen Lines and the Wave-Length of *Hδ*. *Lewis E. Jewell* 9, 211
Gallium Lines in. *W. N. Hartley* and *Hugh Ramage* . 9, 214
Method of Determining Luminosity Curve of. *D. W. Murphy* 11, 220
Reversing Layer Photographed with a Concave Rowland Grating. *J. F. Mohler* and *F. C. Daniel* . . . 12, 361
Absolute Wave-Lengths in. *C. Fabry* and *A. Perot* . 15, 73, 261
Oxygen Absorption Bands of. *O. C. Lester* . . . 20, 81
Remarks on the Foregoing Article. *George Higgs* . . 22, 346
See also under WAVE-LENGTH, ECLIPSE, CORONA, FLASH, etc.
Stars, Evolution of. *Arthur Schuster* 17, 165
Surface and Solar Corona, Connection between Disturbed Areas of. *A. L. Cortie* 24, 355

VOLUME AND PAGE

SOLAR (*Continued*)
System, Preliminary Determination of Motion of. *W. W. Campbell* 13, 80
Evolution of. *F. R. Moulton* 22, 165
Note on Evolution of. *W. H. Pickering* 22, 354
Theory, Contributions to. *R. Emden* 15, 38
SOLIDS, Absorption of Some, for Light of Extremely Short Wave-Lengths. *Theodore Lyman* 25, 45
SOLSTICE, Midnight Illumination above Northern Horizon near Time of Summer. *E. E. Barnard* 24, 128
SOUTHERN Double Stars. *Edward C. Pickering* 6, 258
Stars, Spectra of Bright. *Edward C. Pickering* 6, 349
Stars to the 3½ Magnitude, Spectra of, and Their Distribution. *Frank McClean* 7, 367
SPARK. See also SPECTRUM and SPECTRA
Pressure in. *Eduard Haschek* and *Heinrich Mache* . 9, 347; 12, 50
Pressure in Electric. *John Fred Mohler* 10, 202
Properties of Electric, and Its Spectrum. *Charles C. Schenck* . 14, 116
Discharge from Metallic Poles in Water. *Sir Norman Lockyer* . 15, 190
Lines, Effect of Circuit Conditions upon Wave-Lengths of. *Norton A. Kent* 17, 286
Discharge, Velocity of Metallic Particles in. *Arthur Schuster* . 25, 277
SPECTRA. See also SPECTRUM, LINES, WAVE-LENGTH, BANDS, SOLAR and STELLAR SPECTRA
of the Planets, Recent Researches on. *H. C. Vogel* . 1, 196, 273
of the Elements, Measurement of Some Standard Wave-Lengths in Infra-Red. *E. P. Lewis* 2, 1, 106
of Solid Bodies, Existence of Law in. (See also Errata, 2, Insert). *F. Paschen* 2, 202; 3, 150
Note on the Foregoing Article. *Frank W. Very* 2, 316
Photographic Maps of Metallic. *H. Crew* 2, 318
of Electric Arc and Sun, Appearance of Lines in. *L. E. Jewell* 3, 89
of Certain Elements, Effect of Pressure on Wave-Lengths of Lines in the Arc. *W. J. Humphreys* and *J. F. Mohler* . . 3, 114
W. J. Humphreys 4, 249
Mode of Printing Maps of, and Tables of Wave-Lengths . 4, 306; 5, 216
Arthur Schuster 6, 415
William Huggins 6, 55
Frank W. Very 6, 55
James E. Keeler 6, 144
Violet Part of Metalllic. *O. Lohse* 6, 95
of Elements of Platinum Group, Arc. *H. Kayser* . . 7, 93, 173

VOLUME AND PAGE

SPECTRA (*Continued*)

of Certain Elements, Arc, Theoretical Considerations Respecting Effect of Pressure on Wave-Length in. *J. Wilsing* . . 7, 317
Note on the Foregoing Article. *Charles Godfrey* . . . 8, 114
Influence of Purkinje Phenomenon on Observations of Faint. *W. W. Campbell* 10, 22
of Gases, Effect of Impurities on. *Percival Lewis* . 10, 137; 12, 16
Arc, of Metals in Atmosphere of Hydrogen. *Henry Crew* . 12, 167
Doppler Effect and Reversal in Spark. *John Fred Mohler* . 15, 125
Personal Equation in Measuring Photographic. *B. Hasselberg* 15, 208
Arc, Influence of Atmospheres of Nitrogen and Hydrogen on, Compared with That of Ammonia. *Royal A. Porter* . . 15, 274
of Cathodo-Luminescent Metallic Vapors. *Percival Lewis* . 16, 31
Spark, of Metalloids, Effect of Self-Induction upon. *Henry Crew* 16, 59
of Several Gaseous Nebulae, Intensity-Ratios of Principal Lines in. *J. Scheiner* and *J. Wilsing* 16, 234
Occurrence of Spark Lines in Arc. *J. Hartmann* and *G. Eberhard* 17, 229
Effects of Ruling Errors in Grating. *A. S. King* . . . 17, 239
New Relationship between Arc and Spark. *J. Hartmann* . 17, 270
Effects of Change of Atmosphere on Arc, with Reference to Series Relations. *A. S. King* 18, 129
of Imperfect Gratings. *A. A. Michelson* 18, 278
from the Wehnelt Interrupter. *Harry W. Morse* 19, 162; 21, 223
of Mixed Gases. *P. G. Nutting* 19, 105
Causes of Variability of Spark. *A. S. King* 19, 225
Secondary. *P. G. Nutting* 19, 239
Transition from Primary to Secondary. *P. G. Nutting* . . 20, 131
of Alkali Metals, Some Additions to Arc. *F. A. Saunders* . 20, 188
of Organic Compounds, Preliminary Communication on Infra-Red Absorption. *William W. Coblentz* 20, 207
Appearance of Spark Lines in Arc. *Henry Crew* . . . 20, 274
of Weak Luminescences. *Harry W. Morse* 21, 83, 410
Intensity of Grating. *R. W. Wood* 21, 173
of Metals as Given by an Electric Oven, Some Emission. *A. S. King* 21, 236
Dispersion Bands in Absorption. *W. H. Julius* . . . 21, 271
of Alkaline-Earth Fluorides in Electric Arc. *Ch. Fabry* . . 21, 356
of Alloys. *P. G. Nutting* 22, 131
Variability of Wave-Length in Lines of Spark. *Norton A. Kent* 22, 182
Variation of Arc, with Phase of Current Producing Them. *H. Crew* and *B. J. Spence* 22, 199

	VOLUME AND PAGE
SPECTRA (*Continued*)	
Line Structure in. *P. G. Nutting* 23, 64, 220;	24, 111
Ultra-Violet Absorption, in Relation to Physico-Chemical Processes. *E. C. C. Baly* and *C. H. Desch*	23, 110
from λ 5800 to λ 8500, Photographs of Certain Arc. *Lord Blythswood* and *Walter A. Scoble*	24, 125
SPECTRAL Energy-Curve of a Black Body. *Frank W. Very* . .	10, 208
Phenomena Connected with Cooling of Very Hot Stars. *H. Kayser*	14, 313
Remarks on the Foregoing Article. *J. Scheiner* . . .	15, 342
Photometric Studies. *D. W. Murphy*	6, 1
Photometric Work, New System for. *D. B. Brace* . . .	11, 6
Photometric Measurements, Calibration of Slit in. *E. V. Capps*	11, 25
Series, Law of. *T. N. Thiele*	6, 65
Type, Classification of Stars of First. *H. C. Vogel* . . .	2, 333
SPECTRO-BOLOGRAPHIC Investigations at the Smithsonian Astrophysical Observatory. *George E. Hale*	1, 162
SPECTRO-BOLOMETRIC Purposes, Sensitive Galvanometer for. *C. G. Abbot*	18, 1
SPECTROCOMPARATOR, The. *J. Hartmann*	24, 285
SPECTROGRAMS, Cause of Discrepancy between Measures of. *H. M. Reese*	15, 142
Objective Method for Measurement of. *Karl Kostersitz* .	16, 262
for Determination of Radial Velocities, Method of Measurement and Reduction. Application to Study of Variable Star *W Sagittarii*. *Ralph H. Curtiss*	20, 149
SPECTROGRAPH, Conditions of Maximum Efficiency in Use of. The Modern Spectroscope. XVIII. *F. L. O. Wadsworth* .	3, 321
of Lick Observatory, Mills. (See also Errata, **8**, vii). *W. W. Campbell*	8, 123
Mills, Temperature Control of. *W. W. Campbell* . . .	11, 259
Comparison Spectrum Apparatus of. *W. H. Wright* .	12, 274
Some Recent Results with. *W. W. Campbell* . . .	14, 138
Bruce, of the Yerkes Observatory. *Edwin B. Frost* . .	15, 1
Some Results with. *Walter S. Adams*	15, 214
Miscellaneous Radial Velocity Determinations with. *Walter S. Adams*	18, 67
Observations with. *Edwin B. Frost* and *Walter S. Adams*	19, 350
No. III, Electric Heating of the Potsdam. *J. Hartmann* . .	15, 172
The Lowell. *V. M. Slipher*	20, 1
Observations of Standard Velocity Stars with the Lowell (1905). *V. M. Slipher*	22, 318
A Large Quartz. *Percival Lewis*	23, 390
Objective-Prism Comparison. *De Lisle Stewart* . . .	23, 396

VOLUME AND PAGE

SPECTROGRAPHIC Performance of Thirty-Inch Pulkowa Refractor. *A. Belopolsky* 1, 366
Investigations with Thirty-Inch Refractor of Pulkowa Observatory, Performance of Auxiliary Lens for. *A. Belopolsky* . 3, 147
Work of Emerson McMillin Observatory, Stellar. *H. C. Lord* 6, 424
Analysis of Iron Meteorites, Siderolites, and Meteoric Stones. *W. N. Hartley* and *Hugh Ramage* 9, 221
Measures of the Velocities of Gaseous Nebulae. *J. Hartmann* 15, 287
Observations of Standard Velocity Stars (1902–1903). *Edwin B. Frost* and *Walter S. Adams* 18, 237
Observations of Standard Velocity Stars at Pulkowa. *A. Belopolsky* 19, 85
Observations of Certain Variable Stars. *Edwin B. Frost* . . 22, 213
Observations. *Edwin B. Frost* 23, 264
Work, Character of the Star Image in. *J. S. Plaskett* . . 25, 195
Study of the Fourth Class Variable Stars *Y Ophiuchi* and *T Vulpeculae*. *Sebastian Albrecht* 25, 330
SPECTROGRAPHS for the Potsdam Refractor. *H. C. Vogel* . . 11, 393
Construction and Adjustment of. *J. Hartmann* . 11, 400; 12, 30
SPECTROHELIOGRAPH, Form Suggested by H. F. Newall. *George E. Hale* 5, 211
Method of Correcting Curvature of Lines in. *W. H. Wright* . 5, 325
Curvature of Spectral Lines in. *W. S. Adams* . . . 11, 309
of Potsdam Observatory. *P. Kempf* 21, 49
Work of Rumford. *George E. Hale* 21, 261
Observations with Rumford. *Philip Fox* 21, 351
of the Solar Observatory. The Five-Foot. *George E. Hale* and *Ferdinand Ellerman* 23, 54
A New Form of. *G. Millochau* and *M. Stefánik* . . . 24, 42
Some New Applications of. *George E. Hale* 25, 311
SPECTROHELIOGRAPHIC Results Explained by Anomalous Dispersion. *W. H. Julius* 21, 278
SPECTROLOGY, A Desideratum in. *Edwin B. Frost*. . . . 20, 342
SPECTRO-PHOTOGRAPHY of the Sun, Conditions Which Affect. *A. A. Michelson* 1, 1
SPECTRO-PHOTOMETRIC Adjustments, Notes on. *L. B. Tuckerman* . 16, 145
SPECTROSCOPE, The Modern. For Nos. I–IX see Vols. XI–XIII of *Astronomy and Astrophysics*.
X. General Considerations Respecting the Design of Astronomical Spectroscopes. *F. L. O. Wadsworth* . . 1, 52
XI. Some New Designs of Combined Grating and Prismatic Spectroscopes of Fixed-Arm Type, and a New Form of Objective Prism. *F. L. O. Wadsworth* . 1, 232

VOLUME AND PAGE

SPECTROSCOPE (*Continued*)

XII. The Tulse Hill Ultra-Violet Spectroscope. *William Huggins* 1, 359

XIII. A New Multiple Transmission Prism of Great Resolving Power. *F. L. O. Wadsworth* 2, 264

XIV. Fixed-Arm Concave Grating Spectroscopes. *F. L. O. Wadsworth* 2, 370

XV. Use and Mounting of Concave Grating as Analyzing or Direct Comparison Spectroscope. *F. L. O. Wadsworth* 3, 47

XVI. Device for Isolating Any Portion of the Diffraction Spectrum, and Further Notes on Astronomical Spectroscopes. *F. L. O. Wadsworth* 3, 169

XVII. Description of the Bruce Spectroscope of the 25-Inch Refractor of the Cambridge Observatory. *H. F. Newall* 3, 266

XVIII. Conditions of Maximum Efficiency in Use of Spectrograph. *F. L. O. Wadsworth* 3, 321

XIX. The Objective Spectroscope. *George E. Hale* and *F. L. O. Wadsworth* 4, 54

XX. New Form of Fluid Prism without Solid Walls and Its Use in an Objective Spectroscope. *F. L. O. Wadsworth* 4, 274

Lens for Adapting a Visually Corrected Refracting Telescope to Photographic Observations with. *James E. Keeler* . . 1, 101

On a New Form of. *C. Pulfrich* 1, 335

Dr. Pulfrich's Modification of the Littrow. *James E. Keeler* . 1, 353

of the Emerson McMillin Observatory. *H. C. Lord* . . 4, 50

The Echelon. *A. A. Michelson* 8, 37

Direct Concave Grating. *S. A. Mitchell* 10, 29

of Fixed Deviation. *Ph. Pellin* and *André Broca* 10, 337

Comparison of a Prism and a Grating. *N. Ernest Dorsey* . . 12, 164

Observations on Resolving Power of Michelson Echelon. *P. Zeeman* 15, 218

Theory of the Ocular. *F. L. O. Wadsworth* 16, 1

New Type of Focal Plane, and Its Application to Astronomical Spectroscopy. *F. L. O. Wadsworth* 16, 12

and Telescope, Optical Conditions Required to Secure Maximum Accuracy of Measurement in Use of. (See also Errata, 17, 163.) *F. L. O. Wadsworth* 16, 267; 17, 1, 100

Measurements of Wave-Lengths with Concave Grating Objective. *F. L. O. Wadsworth* 18, 77

Optics of. *Arthur Schuster* 21, 197

SPECTROSCOPES, Design of Astronomical. *James E. Keeler* . . 1, 248

VOLUME AND PAGE

SPECTROSCOPES (*Continued*)
Tables of Resolving Power of. *F. L. O. Wadsworth* . . 6, 27
Relative Efficiencies of. *H. C. Lord* 9, 191
Occulting Shutter for Concave Grating. *Herbert M. Reese* . 24, 49
SPECTROSCOPIC Measurements, Photographic Method of Determining the Visibility of Interference Fringes in. *George E. Hale* 1, 435
Observations of Colored Stars. *Friedrich Krueger* . . . 2, 148
Notes. *W. W. Campbell.* (See also Errata, 5, 350). . . 5, 233
Sir William and *Lady Huggins* 6, 322
Lewis E. Jewell 11, 234
Investigation of Variation of Aqueous Vapor in the Atmosphere, Dr. Arendt's. *Lewis E. Jewell* 5, 279
Work, Use of Grating in Stellar. *F. L. O. Wadsworth* . . 7, 198
Use, Telescope Objective Especially Adapted for. *Charles S. Hastings* 9, 162
Results Obtained at Eclipse of May 28, 1900. *Edwin B. Frost* . 12, 307
Observations of the Eiffel Tower Electric Lights in 1889 to Determine the Atmospheric Absorption of the Visible Rays. *A. Cornu* 13, 142
Studies. I. *Eduard Haschek* 14, 181
Results Obtained during Solar Eclipse of 1901. *W. J. Humphreys* 15, 313
Methods, Contribution to Knowledge of. *H. Konen* . . 17, 81
Investigation of Dr. Urbain's Preparations of Terbium. *G. Eberhard* 24, 309
SPECTROSCOPIC BINARIES
λ *Andromedae*, Variable Velocity of. *W. W. Campbell* . . 10, 178
Orbit of. *Keivin Burns* 24, 345
Antares, Variable Velocity of. *W. H. Wright* . . . 25, 58
β *Arietis*, Orbit of. (See also Errata, 26, 382). *H. Ludendorff* 25, 320
β *Aurigae*, System of. *H. C. Vogel* 19, 360
ε *Aurigae. H. C. Vogel* 17, 243
Variable Velocity of. *W. W. Campbell* and *Heber D. Curtis* 21, 191
κ *Cancri*, Orbit of. (See also Errata, 26, 382). *Naozo Ichinohe* 25, 315
Capella, Observations of. *W. W. Campbell* . . 10, 177; 14, 261
System of. *J. Miller Barr* 11, 248
Orbit of. *H. M. Reese* 14, 263
β *Capricorni*, Variable Velocity of. *W. W. Campbell* . . 10, 241
δ *Capricorni*, Variable Velocity of. *V. M. Slipher* . . . 24, 361
β *Cephei. Edwin B. Frost* 15, 340; 24, 259
U Cephei, Variable Velocity of. *V. M. Slipher* . . . 25, 284
χ *Cygni*, Variable Velocity of. *G. Eberhard* 18, 198

VOLUME AND PAGE

SPECTROSCOPIC BINARIES (*Continued*)

h Draconis, Variable Velocity of. *W. W. Campbell* . . . 10, 178
χ Draconis, Variable Velocity of. *W. W. Campbell* . . 8, 292
Orbit of. *W. H. Wright* 11, 131
θ Draconis, Variable Velocity of. *W. W. Campbell* . . . 9, 311
ω Draconis, Variable Velocity of. *W. W. Campbell* . . . 10, 178
α^1 *Geminorum*. *A. Belopolsky* 5, 1
γ Geminorum, Variable Radial Velocity of. *V. M. Slipher* . 22, 84
ζ Geminorum, Variable Velocity of. *W. W. Campbell* . 9, 86; 13, 90
β Herculis, Variable Velocity of. *W. W. Campbell* . . . 11, 140
ε Leonis, Variable Velocity of. *W. S. Adams* 11, 307
Velocity of. *W. H. Wright* 11, 414
ε Librae, Variable Velocity of. *W. W. Campbell* . . . 10, 178
o Leonis, Variable Velocity of. *W. W. Campbell* . . . 8, 291
β Lupi, *Edward C. Pickering* 7, 139
Mizar. *H. C. Vogel* 13, 324
β Orionis, Variable Velocity of. *W. W. Campbell* and *Heber D. Curtis* 21, 191
η Orionis, Orbit of. (See also Errata, 17, 163.) *Walter S. Adams* 17, 68
η Pegasi, Variable Velocity of. *W. W. Campbell* . . . 8, 159
Observations of. *W. W. Campbell* 14, 202
Orbit of. *Russell Tracy Crawford* 14, 203
ι Pegasi, Variable Velocity of. *W. W. Campbell* . . . 9, 310
Orbit of. *Heber D. Curtis* 19, 212
o Persei. *H. C. Vogel* 17, 212
η Piscium, Possible Variable Velocity of. *H. C. Lord* . . 19, 246
Variable Velocity of. *W. W. Campbell* and *Heber D. Curtis* 21, 191
Polaris, Variable Velocity of. *W. W. Campbell* . 10, 180; 25, 59
Edwin B. Frost . . . 10, 184
J. Hartmann 14, 52
Variable Velocity of. *W. W. Campbell* and *Heber D. Curtis* 21, 191
V Puppis. *Edward C. Pickering* 4, 373
S Sagittae, Variable Velocity of. *Ralph H. Curtiss* . . . 20, 231
v Sagittarii, Variable Velocity of. *W. W. Campbell* . . 10, 241
Y Sagittarii, Variable Velocity of. *Ralph H. Curtiss* . . 20, 231
μ^1 *Scorpii*. *Edward C. Pickering* 4, 235
Sirius, Variable Velocity of. *W. W. Campbell* . . . 21, 176
ζ Tauri, Orbit of. *Walter S. Adams* 22, 115
ε Ursae Minoris, Variable Velocity of. *W. W. Campbell* . . 10, 178
T Vulpeculae, Variable Velocity of. *Edwin B. Frost* . . 20, 296
A Suggestion. *J. Miller Barr* 15, 65
Improved Method of Calculating Orbits of. *Henry Norris Russell* 15, 252

VOLUME AND PAGE

SPECTROSCOPIC BINARIES (*Continued*)

Nine Stars with Variable Velocities [*12 Persei, ξ Ursae Majoris, 93 Leonis, d Boötis, β Scuti, 113 Herculis, 2 Scuti, η Andromedae, κ Pegasi*]. *W. W. Campbell* and *W. H. Wright* . 12, 254

Some Recent Results with the Mills Spectrograph [*π Cephei, o_1 31 Cygni, ξ Piscium, τ Persei, $ξ_1$ Ceti, ε Hydrae, δ Equulei, Polaris, δ Orionis* (*α Persei, θ Ursae Majoris*, Groombridge 1830)]. *W. W. Campbell* 14, 138

Some Results with the Bruce Spectrograph [*o Persei, δ Librae, Sirius*]. *Walter S. Adams* 15, 214

Six Stars Whose Velocities Are Variable [*φ Persei, η Geminorum, γ Canis Majoris, ζ Herculis, α Equulei, o Andromedae*]. *W. W. Campbell* 16, 114

Five Stars Whose Radial Velocities Vary [*δ Ceti, ν Eridani, $π^5$ Orionis, ζ Tauri, η Virginis, $π^4$ Orionis*]. *Edwin B. Frost* and *Walter S. Adams* 17, 150

Additional Stars of the *Orion* Type Whose Velocities Vary [*τ Tauri, ψ Orionis, η Hydrae*]. *Edwin B. Frost* and *Walter S. Adams* 17, 246

Four Stars Whose Velocities Are Variable [*ν Andromedae, $π^4$ Orionis, σ Geminorum, ι Argus*]. *H. M. Reese* . . 17, 308

Two Stars with Variable Velocities [*u Herculis, 57 Cygni*]. *Edwin B. Frost* and *Walter S. Adams* 17, 381

Miscellaneous Velocity Determinations with Bruce Spectrograph. [*61 Cygni, ε Ursae Majoris, β Scorpii, ε Herculis*]. *Walter S. Adams.* 18, 67

Five Stars with Variable Velocities [*γ Corvi, η Virginis, α Draconis, ε Herculis, δ Aquilae*]. *W. W. Campbell* and *Heber D. Curtis* 18, 306

Ten Stars Whose Radial Velocities Vary [*π Andromedae, ξ Cassiopeiae, 22 o Orionis, χ Aurigae, ι Orionis, ν Orionis, 18 Aquilae 2 Lacertae, 6 Lacertae, 1* Hev. *Cassiopeiae*]. *Edwin B. Frost* and *Walter S. Adams* 18, 383

Eight Stars Whose Velocities Vary [*g Persei, ε Persei, $θ^1$ Orionis, $θ^2$ Orionis, σ Orionis, ξ Orionis, S Monocerotis, η Hydrae*]. *Edwin B. Frost* and *Walter S. Adams* 19, 151

Four Stars with Variable Velocity[*9 Camelopardi, κ Cancri, μ Sagittarii, $δ^1$ Lyrae*]. *Edwin B. Frost* and *Walter S. Adams* . 19, 350

Five Stars Having Variable Radial Velocities [*α Andromedae, α Librae, σ Scorpii, X Sagittarii, ε Capricorni*]. *V. M. Slipher* 20, 146

Nine Stars Whose Radial Velocities Vary [*α Andromedae, ζ Ceti, γ Geminorum, $α^2$ Geminorum, η Boötis, ξ Serpentis, ζ Lyrae, τ Sagittarii, 71 Aquilae*]. *W. W. Campbell* and *Heber D Curtis* 21, 185

VOLUME AND PAGE

SPECTROSCOPIC BINARIES (*Continued*)
Twelve Stars Whose Radial Velocities Vary [*α Phoenicis, γ Phoenicis, θ₁ Eridani, X Eridani, δ Columbae, A Carinae, σ Puppis a Puppis, α Volantis, a Carinae, κ Velorum, p Velorum*]. *W. H. Wright* 21, 371
Certain Variable Stars with Variable Radial Velocities [*R Canis Majoris, Z Herculis, U Sagittae*]. *Edwin B. Frost* . . 22, 213
Four Stars Whose Velocities Are Variable [*τ Ursae Majoris, λ Hydrae, μ Ursae Majoris, Y Ophiuchi*]. *J. H. Moore* . 23, 263
Four Stars with Variable Velocities [*B. D.* −1°.1004, *29 Canis Majoris, μ Orionis, T Monocerotis*]. *Edwin B. Frost* . 23, 264
Eight Stars Whose Velocities Are Variable [*1 Geminorum, B.A.C.* 5890=*D.C.* 7579, *δ Sagittae*, [*32*] *o² Cygni, ε Cygni, ζ Cygni, ι Capricorni, SU Cygni*]. *W. W. Campbell* and *J. H. Moore* 25, 54
Southern Stars Having Variable Velocities [*β Reticuli, m Velorum, ν Centauri, v² Centauri*]. *W. H. Wright* 25, 56
Nine Stars Having Variable Velocities [*RZ Cassiopeiae, X Cygni, 13 Ceti, ω Leonis, 85 Pegasi, 19 τ⁵ Eridani, 33 τ⁸ Eridani, 20 τ Orionis, 4 ξ¹ Canis Majoris*]. *Edwin B. Frost* . . 25, 59
SPECTROSCOPY and Astrophysics, Action of Editorial Board of Astrophysical Journal with Regard to Standards in . . . 3, 1
Application of Interference Phenomena to. *A. Perot* and *Charles Fabry* 9, 87
and Astrophysics, Arbitrary Distribution of Light in Dispersion Bands, and Its Bearing on. *W. H. Julius* . . . 25, 95
SPECTRUM. See also SPECTRA, BANDS, LINES, SOLAR and STELLAR SPECTRA, WAVE-LENGTHS.
SPECTRUM OF Alkali Metals, Some Additions to Arc. *F. A. Saunders* 20, 188
Aluminium, Short Wave-Lengths of Spark. *C. Runge* . . 1, 433
Anthracene Vapors, Fluorescent and Absorption. *T. Sidney Elston* 25, 155
Argon, Note on. *H. F. Newall* 1, 372
On the. *H. Kayser* 4, 1
Constitution of Red. *J. R. Rydberg* 6, 338
Red End of. *C. Runge* 9, 281
Conditions Attending Appearance of Lines in. *A. S. King* 21, 344
Beryllium and Boron, Arc. *H. A. Rowland* and *R. R. Tatnall* 1, 14
Cadmium Line of Wave-Length 4800, Shift of. *W. B. Huff* . 14, 41
Line at λ 5086. *Charles Fabry* 19, 116
Caesium. *Hugh Ramage* 16, 43
Some Additions to Arc. *F. A. Saunders* 20, 188
Calcium, Relative Behavior of H and K Lines of. *Sir William* and *Lady Huggins* 6, 77

VOLUME AND PAGE

SPECTRUM OF (*Continued*)
Calcium, Narrow Triplets in. *F. A. Saunders* . . . 21, 195
Carbon. *H. Crew* and *O. H. Basquin* 2, 103
Band-, Resolution into Series of Third Band of. *T. N. Thiele* 8, 1
Dioxide, Absorption and Emission of, in the Infra-Red. *H. Rubens* and *E. Aschkinass* 8, 176
Thermal Development of Spark. *Henry Crew* and *John C. Baker* 16, 61
Wave-Length of Line λ 4267 in. *J. Hartmann* . . 18, 65
Carbonyl Group, Chemical Reactivity of. *A. W. Stewart* and *E. C. C. Baly* 24, 95
Chlorine, Absorption. *Elizabeth R. Laird* . . . 14, 85, 215
Cobalt, Arc. *B. Hasselberg* 4, 288, 343; 5, 38
Copper, Arc. *H. Kayser* 1, 84
Triplets with Constant Differences in Line. *J. R. Rydberg* 6, 239
Detailed Study of Line. *A. S. King* 20, 21
Cyanogen Bands, Peculiarities in Structure of. *A. S. King* . 14, 323
New Heads to. *C. C. Hutchins* 15, 310
vs. Nitrogen Bands. *Percival Lewis* and *A. S. King* . 16, 162
Structure of Third. *Franz Jungbluth* 20, 237
Fluorides in Electric Arc, Spectra of Alkaline-Earth. *Ch. Fabry* 21, 356
Fluorine, Note on. *Joseph Lunt* 22, 256
Gallium, Wave-Lengths of Principal Lines in. *W. N. Hartley* and *Hugh Ramage* 9, 214
Note on the Foregoing Article. *Lewis E. Jewell* . . 9, 229
Germanium, Arc. *H. A. Rowland* and *R. R. Tatnall* . . 1, 149
Helium. *W. Crookes* 2, 227
C. Runge and *F. Paschen* 3, 4
Wave-Length of Some Lines in. *J. F. Mohler* and *L. E. Jewell* 3, 351
Duplicity of D_3 Line in. *A. Riccò* 2, 236
Heavy and Light. *J. S. Ames* and *W. J. Humphreys* . 5, 97
Hydrocarbon Bands, Effects of Sodium on. *Percival Lewis* . 15, 122
Hydrogen. *H. Kayser* 5, 243
Louis A. Parsons 18, 112
New Series in. *J. R. Rydberg*. 6, 233
Variable Bright Line in. *Edward C. Pickering*. . . 7, 139
in Nebulae. *J. Scheiner* 7, 231
Wave-Length of *Hδ* Line in. *W. H. Wright* . . . 9, 50
Lewis E. Jewell . . 9, 211
Spectra of, in *Orion* Nebula and in a Geissler Tube. *W. W. Campbell* 9, 312

VOLUME AND PAGE

SPECTRUM OF (*Continued*)
Hydrogen (*Continued*)
Effect of Pressure upon. *J. Wilsing* 10, 269
Beyond λ 185μμ. *Victor Schumann* 11, 312
Given by Metallic Arc of Tin, Copper, Silver, etc. *O. H. Basquin* 14, 1
Wave-Lengths of Certain Lines of Second. *E. B. Frost* 16, 100
in Region of Extremely Short Wave-Lengths. *Theodore Lyman* 23, 181
Iridium, Arc. *H. Kayser* 7, 173
Iron Radiating in Magnetic Field, Asymmetry in Change of. P. *Zeeman* 9, 47
Standard Lines in Arc. *H. Kayser* 13, 329
Absolute Wave-Lengths in. *C. Fabry* and *A. Perot* 15, 73, 261
in Liquids and in Air at High Pressures, Spark. *G. E. Hale* 15, 132
George E. Hale and *Norton A. Kent* 17, 154
Influence of Atmospheres of Nitrogen, Hydrogen, and Ammonia on Arc. *Royal A. Porter* 15, 274
Enhanced Lines in. *Herbert M. Reese* . . 19, 322; 22, 222
F. E. Baxandall 21, 337
Effect of Pressure of 37 Atmospheres on Certain Lines of Arc. *W. J. Humphreys* 22, 217
Krypton. *C. Runge* 10, 73
Lanthanum, Arc. *H. A. Rowland* and *Caleb N. Harrison* . 7, 373
Lithium, Some Additions to Arc. *F. A. Saunders* . . . 20, 188
Magnesium. James Barnes 21, 74
Band at λ 5007. *H. Crew* and *O. H. Basquin* . . 2, 100
Influence of Atmospheres of Nitrogen, Hydrogen, and Ammonia on Arc. *Royal A. Porter* 15, 274
Line at λ 4481. Wave-Length of. *Henry Crew* . . 16, 246
Line at λ 4481, Modifications of. *Sir William* and *Lady Huggins* 17, 145
Spark. *W. W. Strong* 22, 119
Mercury. *William B. Huff* 12, 103
Compound Triplets in Line. *C. Runge* and *F. Paschen* . 14, 49
Radiation of, in Magnetic Field. *C. Runge* and *F. Paschen* 15, 235; 16, 118
Molybdenum, Arc. *B. Hasselberg* . . . 16, 300; 17, 20
Nickel, Arc. *B. Hasselberg* 4, 288, 343; 5, 38
Enhanced Lines in. *Herbert M. Reese* . . 19, 322; 22, 222
F. E. Baxandall 21, 337
Nitrogen, Fluorescence and Afterglow Phenomena in Vacuum Tubes Containing. *Percival Lewis* 12, 8

VOLUME AND PAGE

SPECTRUM OF (*Continued*)
Nitrogen (*Continued*)
Bands vs. "New Heads to Cyanogen Bands." *Percival Lewis* and *A. S. King* 16, 162
Negative-Pole, and Cathodo-Luminescence. *Percival Lewis* 17, 258
and Its Oxides. *Percival Lewis* 20, 58
Osmium, Arc. *H. A. Rowland* and *R. R. Tatnall* . . . 2, 184
H. Kayser 7, 173
Oxygen, Comparison of, with Extra Lines in Spectra of Helium Stars. *Frank McClean* 7, 367
Series. *C. Runge* and *F. Paschen* 8, 70
Wave-Lengths of Certain Lines in. *Edwin B. Frost* and *Walter S. Adams* 16, 119
Palladium, Arc. *H. A. Rowland* and *R. R. Tatnall* . . 3, 286
H. Kayser 7, 93
Phenanthrene Vapors, Fluorescent and Absorption. *T. Sidney Elston* 25, 155
Platinum, Arc. *H. A. Rowland* and *R. R. Tatnall* . . . 2, 184
H. Kayser 7, 93
Potassium. *Hugh Ramage* 16, 43
Vapor, Fluorescence of. *E. Wiedemann* and *G. C. Schmidt* 3, 207
Some Additions to Arc. *F. A. Saunders* 20, 188
Radium. *C. Runge* 12, 1
Flame. *C. Runge* and *J. Precht* 17, 147
and Its Position in the Periodic Series. *C. Runge* and *J. Precht* 17, 232
Spontaneous Luminous Radiation of. *Sir William* and *Lady Huggins* . . . 18, 151, 390; 22, 204; 23, 152
Rhodium, Arc. *H. A. Rowland* and *R. R. Tatnall* . . . 3, 286
H. Kayser 7, 173
Wave-Number System of. *C. P. Snyder* 14, 179
Rubidium. *Hugh Ramage* 16, 43
Some Additions to Arc. *F. A. Saunders* 20, 188
Ruthenium, Arc. *H. A. Rowland* and *R. R. Tatnall* . . 3, 286
H. Kayser 7, 93
Selenium, Series. *C. Runge* and *F. Paschen* 8, 70
Silicon. *Joseph Lunt* 11, 262
Franz Exner and *Eduard Haschek* 12, 48
Wave-Lengths of λ 4128 and λ 4131 in. *J. Hartmann* 18, 65
Spark and Stellar. *A. De Gramont* 20, 233
Wave-Lengths of Certain Lines in. *Edwin B. Frost* and *Julius A. Brown* 22, 157
with Note on Spectrum of Fluorine. *Joseph Lunt* . . 22, 256
Sodium Vapor, Fluorescence of. *E. Wiedemann* and *G. C. Schmidt* 3, 207

VOLUME AND PAGE

SPECTRUM OF (*Continued*)
Sodium (*Continued*)
Lines, Application of Sellmeier's Dynamical Theory to. *Lord Kelvin* 9, 231
Bands in Bunsen Flame. *Percival Lewis* 15, 296
Vapor, Fluorescence and Absorption. (See also Erratum, 18, 235.) *R. W. Wood* and *J. H. Moore* . . . 18, 94
Some Additions to Arc. *F. A. Saunders* 20, 188
Strontium, Additional Triplets in Arc. *A. Fowler* . . . 21, 81
Narrow Triplets in. *F. A. Saunders* 21, 195
Sulphur, Series. *C. Runge* and *F. Paschen* 8, 70
Dioxide. *Frances Lowater* 23, 324
Terbium, Investigation of. *G. Eberhard* 24, 309
Tin, Influence of Atmospheres of Nitrogen, Hydrogen, and Ammonia on Arc. *Royal A. Porter* 15, 274
Titanium, Arc. *B. Hasselberg* 4, 116, 212
for Comparison. *Edwin B. Frost* 10, 207
Lewis E. Jewell 11, 243
Enhanced Lines in. *Herbert M. Reese* . . 19, 322; 22, 222
F. E. Baxandall 21, 337
Vanadium, Arc. *Henry A. Rowland* and *Caleb N. Harrison* . 7, 273
Arc. (See also Errata, 11, 169.) *B. Hasselberg* 10, 343; 11, 67
Zinc Arc, Normal. *H. Crew* 4, 135
Influence of Nitrogen, Hydrogen, and Ammonia on Arc. *Royal A. Porter* 15, 274
Invariability of Wave-Lengths in Spark and Arc. *J. M. Eder* and *E. Valenta* 19, 251
Zirconium, Arc. *H. A. Rowland* and *Caleb N. Harrison* . 7, 373
Wave-Lengths, Preliminary Table of Solar. *Henry A. Rowland*
λλ 2975.587—3259.567 . . . . . 4, 106, 278
3259.720—3721.779 . . . . . 5, 11, 109, 181
3722.071—4674.484 . . . . 1, 29, 131, 222, 295, 377
4674.648—5913.930 . . . . 2, 45, 109, 188, 306, 360
5914.118—7331.225 . . . . . 3, 141, 201, 356
Corrections and Additions 6, 384
Plates, Device for Putting Wave-Lengths on. *Olin H. Basquin* 1, 166
Note on the Duplicity of the D_1 Line. *A. Riccò* . . . 2, 236
Atmospheric Absorption Bands in Infra-Red. *F. W. Very* . 2, 237
Determination of Wave-Lengths in Infra-Red. *James E. Keeler* 3, 63
Device for Isolating Any Portion of Diffraction. Modern Spectroscope. XVI. *F. L. O. Wadsworth* 3, 169
Determination of Relative Quantities of Aqueous Vapor in the Atmosphere by Means of Absorption Lines of. *L. E. Jewell* 4, 324

VOLUME AND PAGE

SPECTRUM (*Continued*)
of a Planet, Detection of Lines of Water Vapor in. *James E. Keeler* 4, 137
of Sun and Arc, Shading of H and K and Some Other Lines in. *L. E. Jewell* 8, 51
Absorption and Emission, of Aqueous Vapor and Carbon Dioxide in Infra-Red. *H. Rubens* and *E. Aschkinass* . . . 8, 176
Interpolation Formula for Prismatic. *J. Hartmann*. . . 8, 218
of New Stars, Interpretation of. *J. Wilsing* 10, 113
of Black Body at Low Temperatures, Distribution of Energy in. *F. Paschen* 10, 40
of Black Body at High Temperatures, Distribution of Energy in. *F. Paschen* 11, 288
Apparatus of Mills Spectrograph, Comparison. *W. H. Wright*. 12, 274
Production of Line, by Anomalous Dispersion. *R. W. Wood* . 13, 63
Some Properties of the Electric Spark and Its. *Charles C. Schenck* 14, 116
of Lightning. *Edward C. Pickering* 14, 367
Philip Fox 18, 294
of Bunsen Flame, Effects of Sodium on Hydrocarbon Bands in. *Percival Lewis* 15, 122
Arc, with Heavy Currents. *W. B. Huff* 16, 27
Photography, Screens Transparent only to Ultra-Violet Light and Their Use in. *R. W. Wood* 17, 133
Photographs, Photographic Reversals in. *R. W. Wood* . . 17, 361
Series, On Formulae for. *A. Fowler* and *H. Shaw* . . . 18, 21
Analyses, Economizing Light in. *W. J. Humphreys* . . 18, 324
Lines, Analysis of Bright. *James Barnes* 19, 190
A New Band. The Afterglow of Metallic Vapors in Nitrogen *Percival Lewis* 20, 49
Effect of Capacity and Self-Induction upon Wave-Length in Spark. *George W. Middlekauff* 21, 116
Selective Reflection in Infra-Red. *James T. Porter* . . . 22, 229
of Arc in High Vacua. *R. E. Loving* 22, 285
Lines in Series, Formulae for Distribution of. *T. S. Elston* . 23, 162
Lines, Attempt to Find Cause of Width and Pressure-Shift of. *W. J. Humphreys* 23, 233
Polarization and Selective Reflection in the Infra-Red. *A. H. Pfund* 24, 19
Chemical Reactivity of Carbonyl Group as Measured by Its Absorption. *A. W. Stewart* and *E. C. C. Baly* . . . 24, 95
Spectroscopic Study of Spark. *W. B. Anderson* 24, 221
SPECULA, Support System for Large. *G. W. Ritchey* . . . 5, 143

	VOLUME AND PAGE
STANDARDS in Astrophysics and Spectroscopy, Action of Editorial Board of *Astrophysical Journal* with Regard to	3, 1
of Wave-Lengths. *H. Kayser*	19, 157
of Wave-Lengths, Correction of. *J. Hartmann*	20, 41
of Wave-Length, New. *H. Kayser*	20, 327
of Wave-Length, On Establishing New. *A. Perot* and *Ch. Fabry*	20, 318
STAR, Red, Discovered at Wolsingham Observatory. *T. E. Espin*	1, 87
Image in Spectrographic Work, Character of. *J. S. Plaskett*	25, 195
Magnitude, Physical Meaning of. *R. de Kövesligethy*	11, 350
Magnitudes of Father Hagen's Atlas of Variable Stars. *J. G. Hagen*	6, 441
STARLIGHT, Application of Interference Methods to Determination of Effective Wave-Length of. *George C. Comstock*	5, 26
STARS. See also under STELLAR, VARIABLES, SPECTROSCOPIC BINARIES, NOVAE, SPECTRUM.	
Comparison of Photometric Magnitudes of. *Edward C. Pickering*	1, 154
Remarks on the Foregoing Article. *G. Müller* and *P. Kempf*	1, 428
Distribution of, and Distance of Milky Way in *Aquila* and *Cygnus*. *C. Easton*	1, 216
in Clusters, Distribution of. *Edward C. Pickering*	5, 352
New Nebulous. *Edward C. Pickering*	9, 173
Heat Radiation of. *George E. Hale*	9, 360
in Cluster *Messier 13*, Distribution of. *H. K. Palmer*	10, 246
Magnitudes of 919, Observed by Sir John Herschel. *W. Doberck*	11, 192, 270
Abnormal, in Cluster *M 13 Herculis*. *E. E. Barnard*	12, 176
Rude Attempt to Determine Total Light of. *Simon Newcomb*	14, 297
Total Light of All the. *Gavin J. Burns*	16, 166
upon a Photographic Plate, Number of. *Egon von Oppolzer*	16, 332
Proper Motions of. *Gavin J. Burns*	17, 63
Evolution of Solar. *Arthur Schuster*	17, 165
Near Trapezium in *Orion* Nebula, Faint. *J. A. Parkhurst*	20, 136
in Some Globular Star Clusters, Division of, According to Magnitude. *C. D. Perrine*	20, 354
Luminosity of Brightest. *George C. Comstock*	23, 248
STELLAR Photometer, A New Form of. *E. C. Pickering*	2, 89
Distances, Solar Motion as Gauge of. *Simon Newcomb*	6, 441
Photography, Concave Grating for. *Charles Lane Poor* and *S. A. Mitchell*	7, 157
Parallax Plates Taken with the Yerkes Telescope. *Frank Schlesinger*	20, 123

VOLUME AND PAGE

STELLAR SPECTRUM OR SPECTRA .

Andromeda Nebula. *J. Scheiner* 9, 149
η Aquilae. A. Belopolsky 6, 393
α Aquilae. H. C. Vogel 9, 1
Arcturus, Sun-Spot Lines in. *Walter S. Adams* . . . 24, 69
β Aurigae, The K Lines in. *Antonia C. Maury* . . . 8, 173
ε Capricorni. V. M. Slipher 25, 285
δ Cephei. A. Belopolsky 1, 160
ο Ceti. W. W. Campbell 9, 31
Joel Stebbins 18, 341
V. M. Slipher 25, 66, 235
P Cygni. A. Belopolsky 10, 319
χ Cygni. G. Eberhard 18, 198
W Cygni and of *R Scuti. Ralph H. Curtiss* 20, 232
β Lyrae. A. Belopolsky 6, 328
Nova Aquilae, Visible. *W. W. Campbell* 12, 258
Nova Aquilae No. 2. *J. H. Moore* 23, 261
Nova Aurigae, Recent Changes in. *W. W. Campbell* . . 1, 49
Nova Geminorum, Photographic. *C. D. Perrine* . . . 18, 297
H. M. Reese and *H. D. Curtis* 18, 299
Visual Observations of. *H. D. Curtis* 19, 83
Nova Persei. H. C. Vogel 13, 217
Edward C. Pickering 14, 79
Walter Sidgreaves 14, 366
Changes in. *George E. Hale* 13, 238
Observations of the Earlier. *Walter S. Adams* . . . 14, 158
Observations of. *W. W. Campbell* and *W. H. Wright* . 14, 269
Note on. *Joel Stebbins* 14, 292
Nebulosity Surrounding *Nova Persei. C. D. Perrine* . 17, 310
Nova Sagittarii. W. W. Campbell 9, 308
Y Ophiuchi and *T Vulpeculae. Sebastian Albrecht* . . 25, 330
Orion Nebula, Variations in. *W. W. Campbell* . . . 6, 363
J. M. Schaeberle . . . 6, 364
R. G. Aitken 6, 365
W. H. Wright 6, 365
Relative Intensities of Lines in. *C. Runge* . . . 8, 32
and the Purkinje Phenomenon. *W. W. Campbell* . . 8, 317
Photographs Taken with Less Refrangible Rays of. *James E. Keeler* 9, 133
Hydrogen in, and in a Geissler Tube. *W. W. Campbell* . 9, 312
α Orionis. Henry Harrer 10, 290
δ Orionis, Orbit and. *J. Hartmann* 19, 268
and of *Nova Persei*, Dispersion Bands in. *W. H. Julius* . 21, 286

VOLUME AND PAGE

STELLAR SPECTRUM or SPECTRA (*Continued*)

ζ Puppis. *Edward C. Pickering* . . . 5, 92; 6, 259; 13, 230
H. Kayser 5, 95
R Scuti and of *W Cygni.* *Ralph H. Curtiss* 20, 232
T Vulpeculae and *Y Ophiuchi.* Sebastian Albrecht . . 25, 330
Trifid Nebula, Visible. *W. W. Campbell* 2, 161
Stars Having Peculiar Spectra. *M. Fleming* . . . 1, 411; 2, 354
Edward C. Pickering 4, 142, 369; 5, 350; 8, 116; 14, 144; 19, 287; 21, 292; 22, 87; 23, 257
Discovery of Variable Stars from Their Photographic Spectra. *Edward C. Pickering* 1, 27
Spectroscopic Observations of Colored Stars. *Friedrich Krueger* 2, 148
B Band in Stellar Spectra. *W. W. Campbell* 2, 163
Stars Whose Spectra Contain Both Bright and Dark Hydrogen Lines. *W. W. Campbell* 2, 177
Occurrence in Stellar Spectra of Lines of Clèveite Gas. *H. C. Vogel* 2, 333
Classification of Stars of First Spectral Type. *H. C. Vogel* . 2, 333
Automatic Arrangement for Giving Breadth to Stellar Spectra on a Photographic Plate. *William Huggins* . . . 5, 8
Spectra of Bright Southern Stars. *Edward C. Pickering* . . 6, 349
Spectra of Stars of Secchi's Third Type. *James E. Keeler* . 6, 423
Use of Grating in Stellar Spectroscopic Work. *F. L. O. Wadsworth* 7, 198
Summary of Spectra of Southern Stars to 3½ Magnitude. *Frank McClean* 7, 367
Comparison of Oxygen with Extra Lines in Spectra of Helium Stars. *Frank McClean* 7, 367
Spectra and Proper Motion of Stars. *W. H. S. Monck* . . 8, 28
Spectra of Stars of Secchi's Fourth Type. *George E. Hale* . 9, 271
George E. Hale and *Ferdinand Ellerman* 10, 87
Spectra of Stars of Class III*b*. *N. C. Dunér* 9, 119
Comparison of Stellar Spectra of Third and Fourth Types. *George E. Hale* 9, 273
Interpretation of Spectrum of New Stars. *J. Wilsing* . . 10, 113
Position in Reference to Milky Way of Stars of Type IV. *T. E. Espin* 10, 169
Oxygen in Certain Stars. (See also Errata 11, 169.) *David Gill* 10, 272
Origin of Some Lines in Spectra of Stars and of Chromosphere. *W. N. Hartley* 11, 163
Spectra of Stars of *β Crucis* Type. *Joseph Lunt* 11, 262
Spectral Phenomena Connected with Cooling of Very Hot Stars. *H. Kayser* 14, 313
Remarks on the Foregoing Article. *J. Scheiner* 15, 342

VOLUME AND PAGE

STELLAR SPECTRUM or SPECTRA (*Continued*)
Discussion of Questionable Type of Temporary Stars. *J. G. Hagen* 17, 281
Application of Crossley Reflector to Study of Very Faint Spectra. *Harold King Palmer* 18, 218
New Method for Measurement of Stellar Spectra. *J. Hartmann* 20, 338
Spectra of Known Variables. *Edward C. Pickering*. . 22, 90; 23, 260
Relation between Spectra of Sun-Spots and Fourth-Type Stars. *Walter M. Mitchell*. 23, 211
Sun-Spot Lines in Spectra of Red Stars. *George E. Hale* and *Walter S. Adams* 23, 400
Relation between Stellar Spectral Types and Intensities of Certain Lines in Spectra. *Sebastian Albrecht* 24, 333
Note on Interpretation of Spectra of Components of Double Stars Showing Contrasted Colors. *Sir William* and *Lady Huggins* 25, 65
STRONTIUM, Additional Triplets in Arc Spectrum of. *A. Fowler* . 21, 81
Narrow Triplets in Spectra of Calcium and. *F. A. Saunders* . 21, 195
STRUCTURE of Cyanogen Bands, Some New Peculiarities in. *A. S. King* 14, 323
of Third Cyanogen Band, Regularities in. *Franz Jungbluth* . 20, 237
Line. *P. G. Nutting* 23, 64, 220; 24, 111
of the Finest Spectral Lines. *O. von Baeyer* 25, 267
STRUVE, Note on Discovery of Error in Papers of. *F. L. O. Wadsworth* 7, 77
SULPHUR, Series Spectra of. *C. Runge* and *F. Paschen* 8, 70
Dioxide, Spectra of. *Frances Lowater* 23, 324
SUN, See also CHROMOSPHERE, CORONA, ECLIPSE, PROMINENCE, and SOLAR.
Conditions which Affect the Spectro-Photography of. *A. A. Michelson* 1, 1
Schmidt's Theory of. *E. J. Wilczynski* 1, 112; 2, 69
James E. Keeler 1, 178
New Determination of Temperature of. *H. Ebert* 2, 55
F. Paschen. (See also Errata, 2, Insert.) 2, 202
Cause of Granulation of Surface of. *J. Scheiner* 2, 77
Appearance of Lines in Spectra of Electric Arc and. *L. E. Jewell* 3, 89
Law of Rotation of. *J. Wilsing* 3, 247
Wave-Length of D_3 in the. *J. F. Mohler* and *L. E. Jewell* . 3, 351
Effect of Total Eclipse of, on Visibility of Solar Prominences. *George E. Hale* 3, 374
New Explanation of the Appearances on Surface of. *J. Fényi* . 4, 18

VOLUME AND PAGE

SUN (*Continued*)
Oxygen in. *C. Runge* and *F. Paschen* 4, 317
L. E. Jewell 5, 99; 6, 456
Arthur Schuster 5, 162
C. Runge 6, 426
Relative Frequency of H and K Lines in Chromosphere of. *George E. Hale* 6, 157
Drawings, Note on. *Frederick Slocum* 7, 90
Reversing Layer, Depth of. *E. S. Wilczynski* 7, 213
and Arc, Shading of H and K and Some Other Lines in Spectrum of. *Lewis E. Jewell* 8, 51
Chromospheric Line near K in Spectrum of. *Lewis E. Jewell* . 8, 119
Reduction to, of Observations for Motion in Line of Sight. *Frank Schlesinger* 9, 159
Temperature and Composition of Atmosphere of. (See also Errata, 15, 69.) *E. Rogovsky* 14, 234
Drift in Longitude of Faculae on Surface of. *A. L. Cortie* . 14, 317
Figure of. *Charles Lane Poor* 22, 103, 305
Remarks on the Foregoing Article. *L. Ambronn* . . . 23, 343
Spectroscopic Observations of Rotation of. *J. Halm* . . 22, 150
Observation of Zodiacal Light to North of. *Simon Newcomb* . 22, 209
Distribution of Brightness of Ultra-Violet Light on Disk of. *K. Schwarzschild* and *W. Villiger* 23, 284
H and K Lines and Motion of Calcium Vapor in. *W. S. Adams* 23, 45
Short Method of Computing an Approximate Value of Reduction to, in Radial Velocity Determinations. *H. K. Palmer* . 24, 51
A Photographic Comparison of the Spectra of the Limb and the Center of. *George E. Hale* and *Walter S. Adams* . . 25, 300
SUNLIGHT, Anomalous Dispersion of, in Corona, Peculiarities and Changes of Fraunhofer Lines Interpreted as Consequences of. *W. H. Julius* 18, 50
SUNSHINE Recorders, Letter Regarding. *Professor Callendar* . 23, 167, 408
SUN-SPOT Period, Causes of. *E. J. Wilczynski* 7, 124
of September 1898. *J. Fényi* 10, 333
Disturbances, Types of. *A. L. Cortie* 13, 260
Spectrum, Region F to α, Researches in. *Walter M. Mitchell* . 22, 4
Lines in the Spectra of Red Stars. *George E. Hale* and *Walter S. Adams* 23, 400
Lines in the Spectrum of *Arcturus*. *Walter S. Adams* . . 24, 69
Spectra, Preliminary Paper on Cause of Characteristic Phenomena of. *George E. Hale, Walter S. Adams*, and *Henry G. Gale* 24, 185
Spectra, Second Paper on the Cause of the Characteristic Phenomena of. *George E. Hale* and *Walter S. Adams* . . . 25, 75.

VOLUME AND PAGE

SUN-SPOTS, Level of. *Edwin B. Frost* 4, 196
George E. Hale 6, 366
Cause of Darkness of. *J. Evershed* 5, 244
Level of, and Cause of Their Darkness. *A. Riccò* . . . 6, 91
A. L. Cortie . . 7, 239
Period of. *Simon Newcomb* 13, 1
and Terrestrial Magnetism, Minimum. *A. L. Cortie* . . 16, 203
Reversals in Spectra of. *Walter M. Mitchell* 19, 357
Spectra of, in Red and Yellow Regions of Spectrum. *A. L. Cortie* 20, 253
Photographic Observations of Spectra of. (See also Errata, 23, 180). *George E. Hale* and *Walter S. Adams* 23, 11
Periodicity of. *Arthur Schuster* 23, 101
and Fourth-Type Stars, Relation between Spectra of. *Walter M. Mitchell* 23, 211
and Faculae, Ultra-Violet Radiation of. *K. Schwarzschild* and *W. Villiger* 23, 345
Brightness of Inner Edge of Penumbra in. *S. Chevalier* 24, 278; 25, 273
SUPPORT System for Large Specula. *G. W. Ritchey* . . . 5, 143
SURFACES, Use of Cylinder Oils for Reflecting. *Samuel V. Hoffman* 3, 293
Steady Liquid. (See also Errata, 5, 350.) *D. B. Brace* . . 5, 214
Photographic Measurement of Brightness of. *J. Hartmann* . 10, 321
ζ *Tauri*, Orbit of Spectroscopic Binary. *Walter S. Adams* . . 22, 115
Taurus, Nebulous Groundwork in Constellation. *E. E. Barnard* . 25, 218
TELESCOPE, Lens for Adapting a Visually Corrected Refracting, to Photographic Observations with the Spectroscope. *James E. Keeler* 1, 101
and Dome, A combination. *A. E. Douglass* 1, 401
Limit of Visibility of Fine Lines in. *A. A. Michelson* . . 2, 60
for Potsdam, A Large 3, 395
Equatorial, and Polar Heliostat Combined. *F. L. O. Wadsworth* 4, 310
Dome, and Rising Floor of Yerkes Observatory. *George E. Hale* 6, 37
Objective Especially Adapted for Spectroscopic Use. *Charles S. Hastings* 9, 162
New Form of Photographic. *Edward C. Pickering* . . . 9, 175
Note on the Foregoing Article. *James E. Keeler* . . . 9, 269
Long Photographic. *Edward C. Pickering* 10, 223
Reflecting, Field of. *S. C. Reese* 12, 219
Celestial Photography with 40-Inch Visual. *G. W. Ritchey* . 12, 352
Two-Foot Reflecting, of Yerkes Observatory. *G. W. Ritchey* . 14, 217
and Spectroscope, Optical Conditions Required to Secure Maximum Accuracy of Measurement in Use of. (See also Errata, 17, 163) *F. L. O. Wadsworth* . . . 16, 267; 17, 1, 100

VOLUME AND PAGE

TELESCOPE (*Continued*)
Snow Horizontal. *George E. Hale* 17, 314
Bruce Photographic, of Yerkes Observatory. *E. E. Barnard* . 21, 35
Some Tests of the Snow. *George E. Hale* 23, 6
A Vertical Coelostat. *George E. Hale* 25, 68
TELESCOPES, Photographic Correcting Lens for Visual. *James E. Keeler* 1, 350
for Astrophysical Investigations, Comparative Value of Refracting and Reflecting. *George E. Hale* 5, 119
Ranyard Mounting for Reflecting. *George E. Hale* . . . 5, 148
New Form of Mounting Devised by Arthur Cowper Ranyard for Reflecting. *F. L. O. Wadsworth* 5, 132
Possible Form of Mirror for Reflecting. *Charles Lane Poor* . 6, 440
of Relatively Short Focus, Reflecting. (See also Errata, 24, 369.) *H. C. Vogel* 23, 370
Color Filters for Astronomical Photography with Reflecting. *Robert James Wallace* 24, 268
TELESCOPIC Images of Different Forms of Radiating Sources. *F. L. O. Wadsworth* 6, 119
Images, Theory of. *F. L. O. Wadsworth* 6, 463
Images, Effect of Atmospheric Aberration on Intensity of. *F. L. O. Wadsworth* 7, 70
TEMPERATURE Control of the Mills Spectrograph. *W. W. Campbell* 11, 259
Radiation, High-. *P. G. Nutting* 21, 400
of Crater of Electric Arc Light, Effect of Pressure of Surrounding Gas on. *W. E. Wilson* 2, 212
Corrections to Foregoing Article. *W. E. Wilson* and *G. F. Fitzgerald* 5, 101
TEMPERATURES, Distribution of Energy in Spectrum of Black Body at Low. *F. Paschen* 10, 40
Distribution of Energy in Spectrum of Black Body at High. *F. Paschen* 11, 288
Possible Variation of Solar Radiation and Its Probable Effect on Terrestrial. *S. P. Langley* 19, 305
The Black Body and Measurement of Extreme. *Arthur L. Day* and *C. E. Van Orstrand* 19, 1
TERBIUM, Spectroscopic Investigation of Dr. Urbain's Preparations of. *G. Eberhard* 24, 309
TERRESTRIAL Magnetic Disturbances, Solar Origin of. *E. Walter Maunder* 21, 101
Phenomena, Synchronous Variations in Solar and. *H. W. Clough* 22, 42

VOLUME AND PAGE

TESTING Optical Mirrors during Construction, Methods of. *G. W. Ritchey* 19, 53
THERMAL Measurements with Bolometer by Zero Method. *F. L. O. Wadsworth* 5, 268
THERMOSTAT, An Electric. *Horace Darwin* 20, 347
TIN, Spectrum of Hydrogen Given by Metallic Arc of. *O. H. Basquin* 14, 1
Influence of Atmospheres of Nitrogen and Hydrogen on Arc Spectrum of, Compared with That of Ammonia. *Royal A. Porter* 15, 274
TITANIUM, Spectrum of. *B. Hasselberg* 4, 116, 212
for a Comparison Spectrum. *Edwin B. Frost* 10, 207
Lines for Comparison Spectra and Their Prominence in the Chromosphere. *Lewis E. Jewell* 11, 243
Enhanced Lines of. *Herbert M. Reese* 19, 322
F. E. Baxandall 21, 337
Enhanced Series of. *Herbert M. Reese* 22, 222
TRIFID Nebula, Visible Spectrum of. *W. W. Campbell* 2, 161
TROUVELOT, Sale of Instruments and Drawings from Collection of . 5, 217
TULSE HILL Ultra-Violet Spectroscope. The Modern Spectroscope. XII. *William Huggins* 1, 359
TWILIGHT Arc upon the Planet *Mars*, Existence of. *Percival Lowell* 2, 136
TYPE, Classification of Stars of First Spectral. *H. C. Vogel* . . 2, 333
TYPE III, Position of Variable Stars of, in Reference to Milky Way. *T. E. Espin* 10, 169
TYPE IV, Spectra of Stars of Secchi's. *George E. Hale* 9, 271
G. E. Hale and *F. Ellerman* 10, 87
TYPE IV, Position of Stars of, in Reference to Milky Way. *T. E. Espin* 10, 169
TYPES, Stellar Spectra of Third and Fourth. *George E. Hale* . 9, 273
Relation between Stellar Spectral, and Intensities of Certain Lines in Spectra. *Sebastian Albrecht* 24, 333
ULTRA-VIOLET Spectroscope, The Tulse Hill. The Modern Spectroscope. XII. *William Huggins* 1, 359
Rays, New Method of Preparing Plates Sensitive to. *V. Schumann* 3, 220, 387; 4, 144
Coronal Lines. *K. D. Naegamvala* 13, 240
Light, Screens Transparent Only to, and Their Use in Spectrum Photography. *R. W. Wood* 17, 133
Absorption Spectra in Relation to Physico-Chemical Processes. *E. C. C. Baly* and *C. H. Desch* 23, 110
Light on Sun's Disk, Distribution of Brightness of. *K. Schwarzschild* and *W. Villiger* 23, 284

VOLUME AND PAGE

ULTRA-VIOLET (*Continued*)
Radiation of Sun-Spots and Faculae. *K. Schwarzschild* and *W. Villiger*. 23, 345
UNION for Co-operation in Solar Research, International: Meeting at Oxford, September, 1905 . . . . . 22, 276
UNITED STATES Naval Observatory, Recommendations of Board of Visitors to 10, 292
Naval Observatory Eclipse Expedition in 1905. *Colby M. Chester* 23, 128
UNITS, Provisional List of Photometric. *Henry Crew* . . . 7, 298
URANINITE, New Gas Obtained from. *J. Norman Lockyer* . . 3, 29
URBAIN'S Preparations of Terbium, Spectroscopic Investigation of. *G. Eberhard* 24, 309
ζ *Ursae Majoris*, The Spectroscopic Binary. *H. C. Vogel* . . 13, 324
α *Ursae Minoris*. See *Polaris*.
ε *Ursae Minoris*, Variable Velocity of, in Line of Sight. *W. W. Campbell* 10, 178
VACUA, The Arc in High. *R. E. Loving* 22, 285
VACUUM Tube, Wave-Length of Some Helium Lines in. *J. F. Mohler* and *L. E. Jewell* 3, 351
Tubes Containing Nitrogen, Fluorescence and Afterglow in. *Percival Lewis* 12, 8
VANADIUM, Occurrence of, in Scandinavian Rutile. *B. Hasselberg* . 5, 194
Presence of, in Rutile. *H. A. Rowland* 6, 157
B. Hasselberg 6, 369
Arc-Spectrum of. *Henry A. Rowland* and *Caleb N. Harrison* . 7, 273
Wide Cosmical Dissemination of. *B. Hasselberg* . . . 9, 143
Arc-Spectrum of. (See also Errata, 11, 169.) *B. Hasselberg*. . 10, 343; 11, 67
VAPOR, Detection of Lines of Water, in Spectrum of a Planet. *James E. Keeler* 4, 137
VAPORS, Spectra of Cathodo-Luminescent Metallic. *Percival Lewis* 16, 31
in Nitrogen, Afterglow of Metallic. *Percival Lewis* . . . 20, 49
The Fluorescent and Absorption Spectra of Anthracene and Phenanthrene. *T. Sidney Elston* 25, 155
VARIABILITY of *Iris* (7). *Edward C. Pickering* 19, 220
in Asteroids, Photographic Method for Detection of. *Joel H. Metcalf* 25, 264
Variabilium, Atlas Stellarum, Specimen Chart from. *J. G. Hagen* . 8, 160
VARIABLE STARS.
Lists of New. *M. Fleming* 1, 411; 2, 198, 354
E. C. Pickering 3, 296; 4, 138, 234, 369; 7, 208; 13, 226; 23, 257

VOLUME AND PAGE

VARIABLE STARS (*Continued*)

Algol Type Variables.

+17°.4367 *W Delphini*. *Edward C. Pickering* . . 3, 77, 163, 200, 213; 4, 320; 7, 23

+45°.3062 in *Cygnus*. *Edward C. Pickering* . . . 10, 126

Densities of. *Henry Norris Russell* 10, 315

J. H. Jeans 22, 93

SY Cygni, Mme. Ceraski's Second. *Edward C. Pickering* 11, 165

RR Puppis and *V Puppis*, Orbits of. *A. W. Roberts*. . 13, 177

Early Observations of. *Edward C. Pickering* . . . 15, 229

+43°.4101, New. *Edward C. Pickering* 15, 343

13.1902, Williams' New. *Edward C. Pickering* . . 16, 337

−15°.4905, New. *Edward C. Pickering* 20, 296

S Antliae. *Edward C. Pickering* 9, 179

Y Aquilae. *Edward C. Pickering* 8, 57

1921 *W Aurigae*. *J. A. Parkhurst* 18, 309

X Cancri, *Es.-Birm. 281*. *T. E. Espin* 1, 351

δ Cephei, Short Period. *L. A. Eddie* 3, 227

X Cephei. (See also Errata, 17, 163.) *J. A. Parkhurst* . 17, 48

7792 *SS Cygni*. *J. A. Parkhurst* and *Zaccheus Daniel* . . 12, 259

Y Cygni, Observations and Ephemerides of. *N. C. Dunér* . 14, 149

in Cluster *M 13 Herculis*, Discovery and Period of. *E. E. Barnard* 12, 182

SV Herculis, New. *Edward C. Pickering* 20, 358

Z Herculis, On Periodic Changes of. *N. C. Dunér* . 1, 285; 3, 348

6871 *V Lyrae*. *J. A. Parkhurst* 18, 33

Y Ophiuchi and *T Vulpeculae*, Spectrographic Study of the Fourth Class. *Sebastian Albrecht* 25, 330

in *Orion* Nebula. *Edward C. Pickering* 19, 289

in *Orion* Nebula in Connection with Chart for *T Orionis*. *John G. Hagen* 19, 344

U Pegasi. *Edward C. Pickering* 7, 141

G. W. Myers 8, 163

W Sagittarii, Applications to Study of. Method of Measurement and Reduction of Spectrograms for Determination of Radial Velocities. *Ralph H. Curtiss* 20, 149

W Ursae Majoris, Unusually Short Period of New. *G. Müller* and *P. Kempf* 17, 201

3416 *S Velorum*. *James E. Keeler* 1, 262

U Vulpeculae and *ST Cygni*. *Edward C. Pickering* . . 9, 179

Discovery of, from Their Photographic Spectra. *Edward C. Pickering* 1, 27

VOLUME AND PAGE

VARIABLE STARS (*Continued*)
Light Curves of, Determined Photometrically. *Edward C. Pickering* 3, 281
Work of the Harvard Observatory on. *Edward C. Pickering* . 6, 418
Magnitudes of Father Hagen's Atlas of. *J. G. Hagen* . . 6, 441
in Clusters. *Edward C. Pickering* . . 2, 321; 6, 258; 7, 208
Comparison Stars for. *Edward C. Pickering* 7, 308
of Short Period. *Edward C. Pickering* 8, 55
of Type III, Position in Reference to Milky Way. *T. E. Espin* 10, 169
in Cluster *Messier 5*, Periods of. *S. I. Bailey* 10, 255
of Short Period, Relation between Visual and Photographic Light Curves of. *S. I. Bailey* 10, 261
Observations of, with 12-Inch and 40-Inch Refractors. *George E. Hale* 12, 52
in Clusters. Rate of Increase in Light. *Edward C. Pickering* 8, 257; 12, 159
Co-operation in Observing. *Edward C. Pickering* . . . 13, 167
Notes on. *J. A. Parkhurst* 14, 169
Publication of New Catalogue of. *Messrs. Dunér, Hartwig, Müller, Oudemans* 14, 214
Spectrographic Observations of Certain. *Edwin B. Frost* . . 22, 213
Photographic Photometry of Short-Period. *J. A. Parkhurst* and *F. C. Jordan* 23, 79
Spectra of Known. *Edward C. Pickering* . . 22, 90; 23, 260
VARIATIONS, Close Binary Systems and Their Relation to Short Period. *Alexander W. Roberts* 2, 283
in Solar and Terrestrial Phenomena, Synchronous. *H. W. Clough* 22, 42
Vega, Heat Radiation of. *E. F. Nichols* 13, 101
VELOCITIES OR VELOCITY, RADIAL. For Variable Velocities see SPECTROSCOPIC BINARIES.
in System of *Saturn*. *W. W. Campbell* 2, 127
Differential Method of Determining. *Edwin B. Frost* . . 2, 235
of Stars, Relative. *Edward C. Pickering* 4, 370
Sources of Error in Investigation on. *H. C. Vogel* . . . 7, 249
Stellar. *H. C. Lord* 8, 65
Some Stars with Great. *W. W. Campbell* 8, 157
of α *Aquilae*. *H. C. Vogel* 9, 1
Reduction to Sun of Observations for. *Frank Schlesinger* . 9, 159
Methods of Determining. *H. Deslandres* 9, 167
Constants for Determination of. *Frank Schlesinger* . . 10, 1
for Determining Parabolic Orbit. *F. R. Moulton* . . . 10, 14
Moon's Theoretical. *W. W. Campbell* 11, 141

VOLUME AND PAGE

VELOCITIES OR VELOCITY, RADIAL (*Continued*)
Determination, Probable Error of. *W. W. Campbell* . . 11. 167
Determination of Stellar. *H. C. Vogel* 11, 373
Some Stars with Large. *W. W. Campbell* 13, 98
of α *Persei*. *H. C. Vogel* 13, 320
Note on. *Sir William Huggins* 14, 369
of Gaseous Nebulae. *J. Hartmann* 15, 287
of the *Orion* Nebula. *H. C. Vogel* 15, 302
Edwin B. Frost and *Walter S. Adams* . 19, 350
of Selected Stars, Co-operation in Observing. *Edwin B. Frost* . 16, 169
Star with Great. *H. M. Reese* 17, 310
Standard Stars 1902–1903, Observations of. *Edwin B. Frost* and *Walter S. Adams* 18, 237
A. Belopolsky 19, 85
of Brighter Stars in *Pleiades*. *Walter S. Adams* . . . 19, 338
Observations with the Bruce Spectrograph. *Edwin B. Frost* and *Walter S. Adams* 19, 350
Constants for Some Stars of the *Orion* Type. *Emily Elisabeth Dobbin* 19, 382
Method of Measurement and Reduction of Spectrograms for Determination of. Application to Study of Variable Star *W Sagittarii*. *Ralph H. Curtiss* 20, 149
Determination of, at Pulkowa. *A. Belopolsky* 21, 55
of Thirty-One Stars, Observations of, Made at Emerson McMillin Observatory. *H. C. Lord* 21, 297
near Full Moon, On Computation of Moon's. *R. H. Curtiss* . 21, 376
of Standard Stars (1905), Observations with the Lowell Spectrograph of. *V. M. Slipher* 22, 318
Proposed Method for Determination of. *George C. Comstock* . 23, 148
Determination of, by Objective Prisms. *Edward C. Pickering* . 23, 255
Determinations, Short Method of Computing Approximate Value of Reduction to Sun in. *H. K. Palmer* 24, 51
of Metallic Particles in Spark Discharge. *Arthur Schuster* . 25, 277
S Velorum, The Variable Star 3416. *James E. Keeler* . . . 1, 262
Vela [*X Centauri*], New Variable Star in. *M. Fleming* . . . 2, 354
Venus, Mascari's Observations of 3, 226
Physical and Micrometrical Observations of, Made at Lick Observatory. *E. E. Barnard* 5, 299
Atmosphere of. *Henry Norris Russell* 9, 284
VISIBILITY of Fine Lines in a Telescope, Limit of. *A. A. Michelson* 2, 60
U Vulpeculae and *ST Cygni*, Variable Stars. *Edward C. Pickering* 9, 179
T Vulpeculae, Radial Velocity of. *Edwin B. Frost*. . . . 20, 296

VOLUME AND PAGE

T Vulpeculae (*Continued*)
and *Y Ophiuchi*, A Spectrographic Study of the Fourth Class Variable Stars. *Sebastian Albrecht* 25, 330
WASHBURN Observatory, Research Work at. *George C. Comstock* . 6, 419
WATER Vapor, Detection of Lines of, in Spectrum of a Planet. *James E. Keeler* 4, 137
WAVE-LENGTH. See also SPECTRUM and LINES.
of D_3 Line in Spectrum of Chromosphere. *George E. Hale* . 2, 384
of Some of the Helium Lines in Vacuum Tube and of D_3 in the Sun. *J. F. Mohler* and *L. E. Jewell* 3, 351
Effect of Pressure on. (See also Errata, 4, 374.) *J. F. Mohler* 4, 175
Effect of Pressure on. *W. J. Humphreys* . . . 6, 169, 428
of Starlight, Application of Interference Methods to Determination of Effective. *George C. Comstock* 5, 26
Theoretical Considerations Respecting Effect of Pressure on. *J. Wilsing* 7, 317
Note on the Foregoing Article. *Charles Godfrey* . . . 8, 114
of the Hydrogen Line *Hδ*. *W. H. Wright* 9, 50
of *Hδ* and Appearance of Solar Spectrum near Hydrogen Lines. *Lewis E. Jewell* 9, 211
of Green Coronal Line. *W. W. Campbell* 10, 186
of Corona Line. *C. A. Young* 10, 306
Determinations and General Results Obtained at Eclipse of January 22, 1898. *J. Evershed* 13, 223
Heat Radiation of Long, Emitted by Black Bodies. *H. Rubens* and *F. Kurlbaum* 14, 335
Selective Absorption as a Function of. *George E. Hale* . . 15, 227
of the Magnesium Line at λ 4481. *Henry Crew* 16, 246
of Cadmium Line at λ 5086. *Charles Fabry* 19, 116
On Establishing New Standards of. *A. Perot* and *Ch. Fabry* . 20, 318
New Standards of. *H. Kayser* 20, 327
in Spark Spectrum, Effect of Capacity and Self-Induction upon. *George W. Middlekauff* 21, 116
in Lines of Spark Spectra, Variability of. *Norton A. Kent* . 22, 182
WAVE-LENGTHS, Preliminary Table of Solar Spectrum. *Henry A. Rowland*
λλ 2975.587–3259.567 . . . . . 4, 106, 278
3259.720–3721.779 . . . . . 5, 11, 109, 181
3722.071–4674.484 . . . . . 1, 29, 131, 222, 295, 377
4674.648–5913.930 . . . . . 2, 45, 109, 188, 306, 360
5914.118–7331.225 . . . . . 3, 141, 201, 356
Corrections and Additions 6, 384
on Spectrum Plates, Device for Putting. *Olin H. Basquin* . 1, 166

VOLUME AND PAGE

WAVE-LENGTHS (*Continued*)

of Spark Spectrum of Aluminium, Short. *C. Runge* . . . 1, 433
in Infra-Red Spectra of the Elements. Measurement of Some Standard. *E. P. Lewis* 2, 1, 106
in Infra-Red Spectrum, Determination of. *James E. Keeler* . 3, 63
of Lines in Arc-Spectra of Certain Elements, Effect of Pressure on. *W. J. Humphreys* and *J. H. Mohler* . . . 3, 114
W. J. Humphreys 4, 249
Mode of Printing Tables of. *H. Kayser* and others . 4, 306; 5, 216
William Huggins . . . 6, 55
Frank W. Very . . . 6, 55
James E. Keeler . . . 6, 144
Arthur Schuster . . . 6, 415
of Spectral Lines, New Formula for. *J. J. Balmer* . . . 5, 199
of Principal Lines in Spectrum of Gallium. *W. N. Hartley* and *Hugh Ramage* 9, 214
of Hydrogen Lines, Effect of Pressure upon. *J. Wilsing* . . 10, 269
Corrections to Determinations of Absolute. *Edwin B. Frost* . 10, 283
of Brighter Nebular Lines, Determination of. *W. H. Wright* . 16, 53
in Solar Spectrum and in Spectrum of Iron, Absolute. *C. Fabry* and *A. Perot* 15, 73, 261
of Certain Lines of Second Spectrum of Hydrogen. *Edwin B. Frost* 16, 100
of Certain Oxygen Lines. *Edwin B. Frost* and *Walter S. Adams* 16, 119
of Lines of Rowland's Solar Spectrum, Systematic Errors in. *G. Eberhard* 17, 141
of Spark Lines, Effect of Circuit Conditions upon. *Norton A. Kent* 17, 286
of Silicon Lines λ 4128 and λ 4131 and of Carbon Line λ 4267. *J. Hartmann*. 18, 65
Measurements of, with Concave Grating Objective Spectroscope. *F. L. O. Wadsworth* 18, 77
Revision of Rowland's. (See also Errata, 19, 84.) *J. Hartmann* 18, 167
Perot-Fabry Corrections of Rowland's. *Louis Bell* . . . 18, 191
Corrections to Rowland's. *C. Fabry* and *A. Perot* . . . 19, 119
Standards of. *H. Kayser* 19, 157
in Spark and Arc Spectrum of Zinc, Invariability of. *J. M. Eder* and *E. Valenta* 19, 251
Discovered by Schumann, Preliminary Measurement of Short. *Theodore Lyman* 19, 263
Correction of Standards of. *J. Hartmann* 20, 41
Remarks on Standard. *Henry Crew* 20, 313

VOLUME AND PAGE

WAVE-LENGTHS (*Continued*)
Revision of Rowland's System of Standard. *Lewis E. Jewell* . 21, 23
of Certain Silicon Lines. *Edwin B. Frost* and *Julius A. Brown* 22, 157
The Absorption of Some Solids for Light of Extremely Short. *Theodore Lyman* 25, 45
Investigations on Plane Reflection Gratings, with Reference to Their Use in the Absolute Determination of. *Ernst Giesing* 25, 237
WAVE-NUMBER System of Rhodium. *C. P. Snyder* 14, 179
WEDGE Constant of a Stellar Photometer, Determination of. *J. A. Parkhurst* 13, 249
WEHNELT Interrupter, Spectra from. *Harry W. Morse* . 19, 162; 21, 223
WELLS' *Algol* Variable. *Edward C. Pickering* 3, 213
WITT'S Planet (433) *DQ*, *Edward C. Pickering* . . 8, 261; 9, 53
WOLF-RAYET Star *DM* +30°3639, Hydrogen Atmosphere Surrounding. *James E. Keeler* 8, 113
WOLSINGHAM Observatory *Circular* No. 41. *T. E. Espin* . . 1, 87
XENON in the Chromosphere. *S. A. Mitchell* 17, 224
X-RAYS, Physical Properties of. A Review. *C. W. Waidner* . 5, 282
YALE Observatory, Photographic Observations of the Leonids of 1898 at. *W. L. Elkin* 9, 20; 10, 25
Velocity of Meteors Deduced from Photographs at. *W. L. Elkin* 12, 4
YERKES OBSERVATORY, Bulletins of. (For titles see under "HALE, GEORGE E." in Author Index.) No. 1, 3, 215; No. 2, 6, 147; No. 3, 6, 262; No. 4, 6, 271–321, 353–362; No. 5, 6, 415; No. 6, 9, 184; No. 7, 9, 271; No. 8, 9, 272; No. 9, 9, 273; No. 10, 9, 358; No. 11, 9, 360; No. 12, 10, 287; No. 13, 12, 52; No. 14, 12, 80; No. 15, 12, 161; No. 16, 13, 173; No. 17, 13, 238; No. 18, 14, 146; No. 19, 17, 300.
Note on the. *George E. Hale* 2, 74
Test of Forty-Inch Objective of. *James E. Keeler* . . . 3, 154
of the University of Chicago. *George E. Hale* . . .
I. Selection of the Site 5, 164
II. The Building and Minor Instruments . . . 5, 254
III. The Instrument and Optical Shops, and the Power House 5, 310
IV. The 40-Inch Telescope, Dome, and Rising Floor of. . 6, 37
Dedication of. *George E. Hale* 6, 58, 353
Aim of. *George E. Hale* 6, 310
Proceedings of Conference Held at, October, 1897 . . . 6, 415
Election of Edwin Brant Frost as Professor of Astrophysics at. *George E. Hale* 8, 59
Opportunities for Students at. *George E. Hale* . . . 9, 272
Photography with 40-Inch Visual Telescope of. *G. W. Ritchey* . 12, 352

VOLUME AND PAGE

YERKES OBSERVATORY (*Continued*)
Latitude and Longitude of. *George E. Hale* 14, 146
Two-Foot Reflecting Telescope of. *G. W. Ritchey* . . . 14, 217
Bruce Spectrograph of. *Edwin B. Frost*. 15, 1
Solar Research at. *George E. Hale* 16, 211
Fire at. *George E. Hale* 17, 86
Publications of 19, 224
Expedition for Solar Research of. *George E. Hale* . . . 19, 385
Bruce Photographic Telescope of. *E. E. Barnard* . . . 21, 35
Snow Fund of. *Edwin B. Frost* 24, 219
YTTERBIUM in Fluor-Spar, Presence of. *W. J. Humphreys* . . 20, 266
A Few Additional Fluor-Spars Containing. *W. J. Humphreys* . 22, 157
YTTRIUM in Fluor-Spar, Presence of. *W. J. Humphreys*. . . 20, 266
A Few Additional Fluor-Spars Containing. *W. J. Humphreys* 22, 157
ZEEMAN Phenomena, Kinematic Interpretation of. *M. A. Cornu* . 6, 378
New Results Relating to Phenomena Discovered by. *M. A. Cornu* 7, 163
Effect. *J. S. Ames, R. F. Earhart* and *H. M. Reese* . . 8, 48
H. M. Reese 12, 120
N. A. Kent 13, 289
ZINC Arc, Normal Spectrum of. *Henry Crew* 4, 135
Influence of Atmospheres of Nitrogen and Hydrogen on Arc Spectrum of, Compared with That of Ammonia. *Royal A. Porter* 15, 274
Invariability of Wave-Lengths in Spark- and Arc-Spectrum of. *J. M. Eder* and *E. Valenta* 19, 251
ZIRCONIUM, Arc-Spectrum of. *Henry A. Rowland* and *Caleb N. Harrison* 7, 373
ZODIACAL LIGHT to North of Sun, Observation of. *Simon Newcomb* 22, 209
Newcomb's Observation of. *E. E. Barnard* 23, 168
Observations, Note on. *Simon Newcomb* 23, 169